The Canadian Builder and Carpenter

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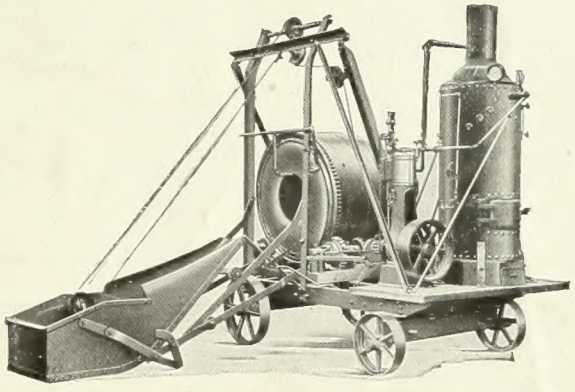
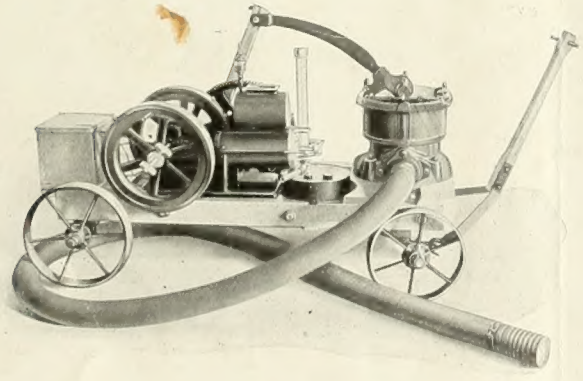
You Can't Go Wrong in buying a "Wettlaufer Heartshape Mixer"

It does ***better*** work and does it ***quicker*** than any mixer.

The Heartshape Drum

gives a positive mix and a clean dump. Strongly constructed and automatically controlled this mixer will economize in time and labour right along—it will save you money on every day's work it does, and will give the most satisfactory every-day working service it is possible to obtain in Concrete Mixers. Come and see it working.





Don't Lose Money

on a job by using hand pumps—for every day's work your hand pumps cost you $5.00. Here is a pump that will pump out your abutments and foundations or any place where you are troubled with water at an average rate of 2,000 gallons per hour—does more than the work of two men at a cost of not more than 35c a day—that is a direct saving of time, labour and money—a saving that will very soon pay the cost of the pump.

No Contractor Should be without one of these pumps.

Get away from the old hand pumps—avail yourself of the advantages of modern methods—save money and at the same time possess an up-to-date equipment.

Send for Catalogues of Mixers, Pumps and Mitchell Crushers.

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This trade mark is your guarantee of quality

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this one particular feature of your Building being of the very highest grade.

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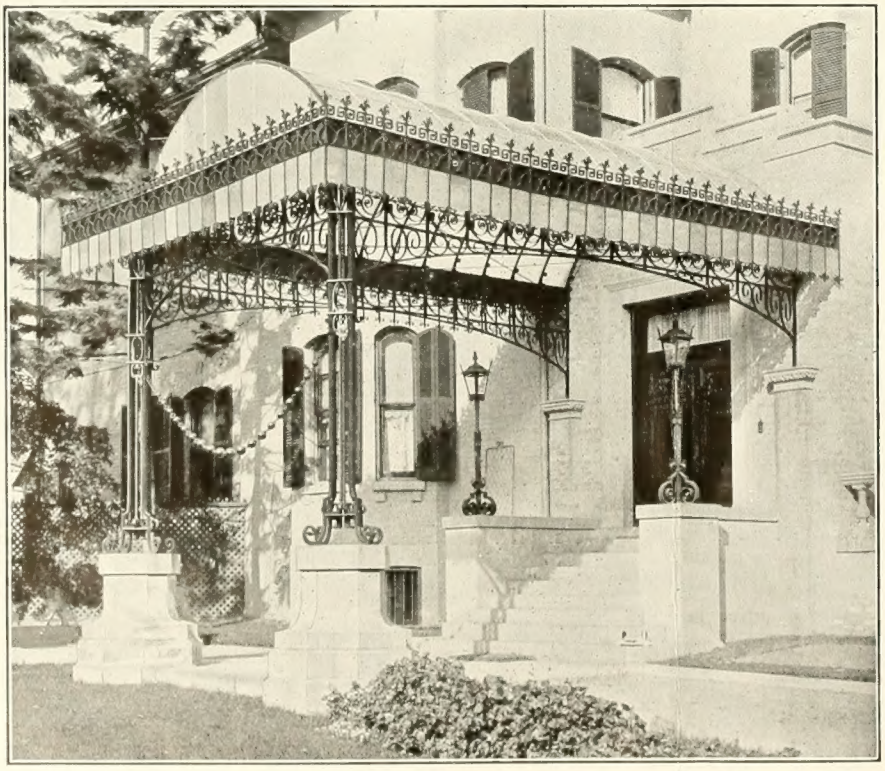

For

Ornamental Iron Work

Iron Stairs

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Balcony Railings

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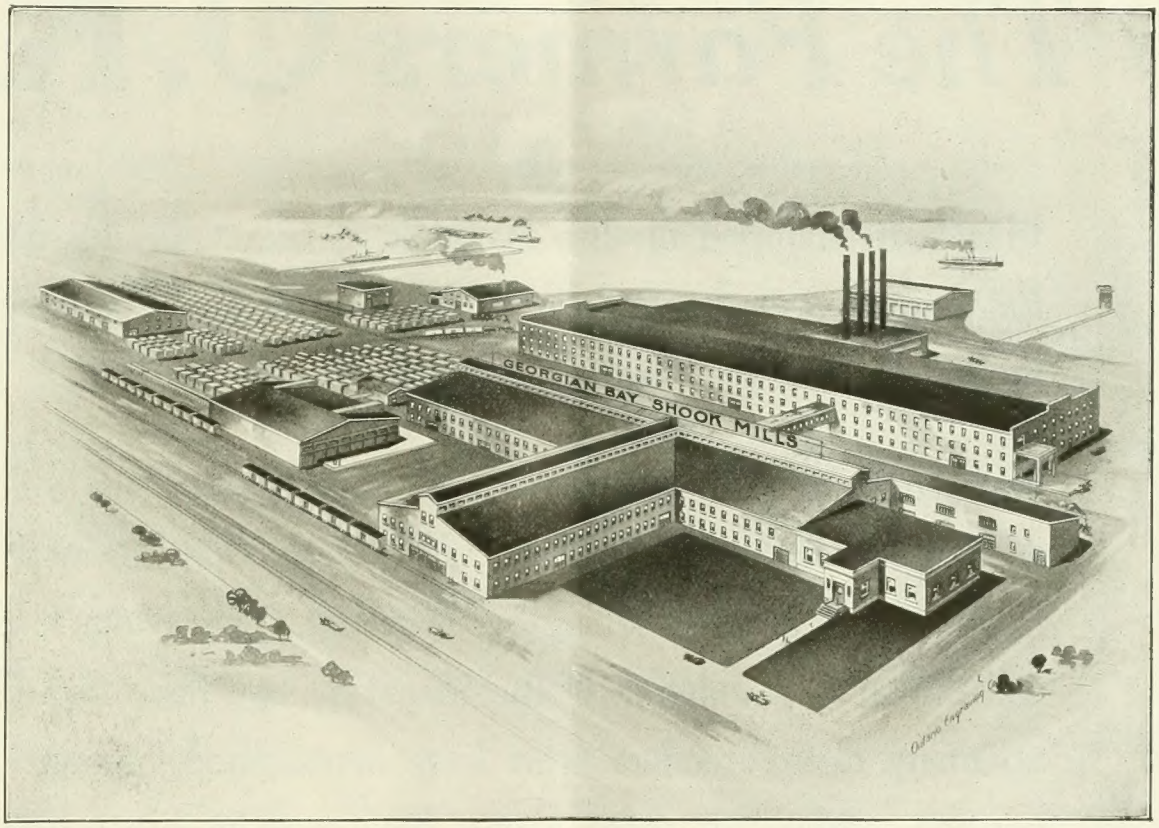
Wire Work for Buildings

Write

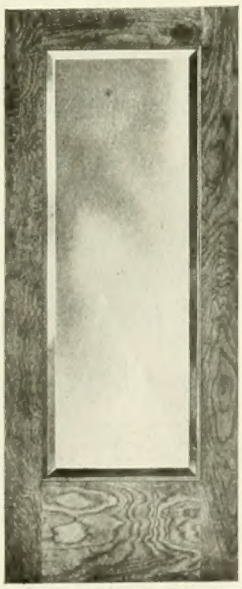
The GEO. B. MEADOWS, Toronto, Wire, Iron and Brass Works Co., Limited

TORONTO :: ONTARIO

Midland Veneered Doors



The Largest Plant in Canada, Manufacturing Planing Mill Products
(Located in the Heart of the Canadian Lumbering District)



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Capacity, 50 per day

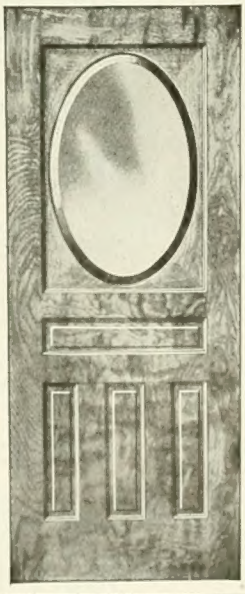
Send for Catalogue and Price List

We Manufacture

Everything for the house that is made of wood. Ask about our A1 and B3 Pine Doors—always in stock.

We Guarantee

1. High grade goods. 2. Prompt Shipments. 3. Satisfaction.



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Ask us for Quotations

Midland, Ontario

Special Attention to Details

The Farmers O.K.

Has been stamped on the materials manufactured by us. Farmers all over the world are using our materials because they know that they are getting good service.

Our agents all over the country are making money as well as friends selling our materials. We want YOU to make money and friends by selling our materials. Since our first call through the columns of this magazine, we have signed up many of the readers who have investigated our proposition. Many of those agents have sent in big orders and have prospects for more.

Supposing you write in today and get our proposition. There is money in it for you. You cannot get better service or treatment from any concern in the world than you can from us. We will give you just what we promise. We will give you the help of our travellers on all your hard prospects. We will give you the service of our Building Expert. Try us out. If you don't like us you don't have to stick. We are willing to let you give us

a trial. We know that we can be of a lot of value to you—just as you will be a lot of value to us.

If you are a builder write today and see what we have to offer.

We have just issued a little booklet which gives some interesting facts about roofing materials and the history of our shingle. It also tells a few other things which might be interesting to you. Just drop us a card today and ask for it. It is free.

Don't forget about our ridge, valley and eavestrough and sundries when you make plans for that next building. We have some attractive offers to make you on these building materials. Sit down today and drop us a card asking about them. Mention The Canadian Builder, so we will know what to tell you.

The Metal Shingle & Siding Co.

Preston, Ont. and Montreal, Que.

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Runs from any lamp socket **Cross Cuts, Rips, Miters, Dados, Bores and Grinds**

Will house out stair string in any wood

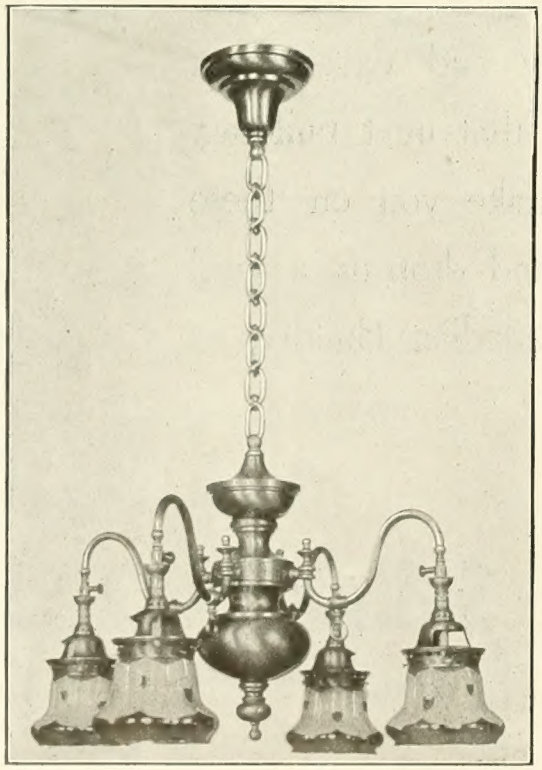
Patented in Canada, 1910
Patent applied for in U.S.

Do you wish to save 30% to 40% of your labor bill? We guarantee that you can do so with our machine. Over 100 in use in Toronto and Hamilton alone. Can be run by any Carpenter.

Write for Particulars and Price to-day

ELLIOT WOODWORKER COMPANY

Corner Bathurst and College Streets, Toronto



Artistic Fixtures And Gas—

ELABORATE fixtures are dependent, for their effectiveness, on the quality of the illuminant used. If the fixture be composed of **Art Glass** the light must be white to ensure a harmonious blending of the colors.

Gas sheds an intense white light, and when used in artistic fixtures makes them an ideal setting for an efficient and reliable illuminant. You get a steady white light, no eye strain, no flickering.

At our Adelaide Street showroom we carry an immense stock of all kinds of gas fixtures. They come in all sizes, designs, and prices. We cordially invite you to look over our assortment, and are assured that you will see something that will solve your lighting problem.

THE CONSUMERS' GAS COMPANY

12-14 Adelaide St. West, Toronto **Phone Main 1933**

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Using Our

"Little Giant" Floor Scrapers

Why not you? They never fail. Absolutely guaranteed. Write us to-day re

"FREE TRIAL OFFER"

A machine sent to you FREE
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Hurley Machine Co., Limited

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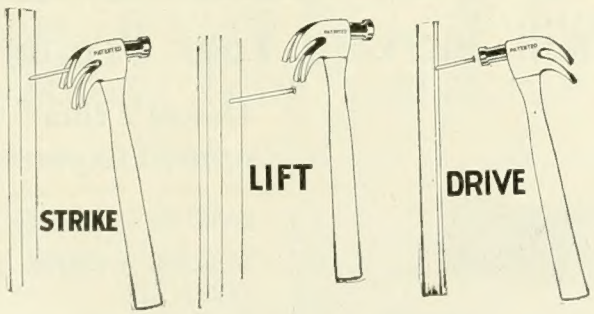

Great for high nailing. It pays for itself almost at once. Make money using it.

Double Claw Hammer

Lewis Brothers, Limited

Wholesale Distributors
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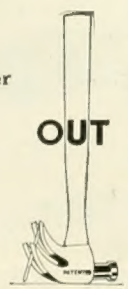
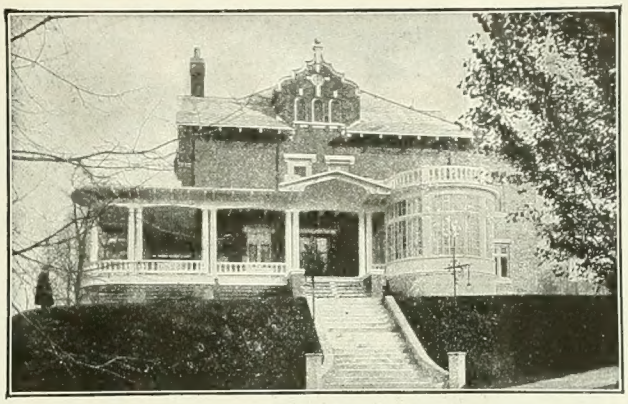
Ottawa Toronto Vancouver

Pulls the nail out straight without a block.





Where Good Roofing Counts

If you are building a house which you will want to sell as soon as it is completed, you will be interested in this.

One of the most conspicuous features of that house will be the roof. Its shape, the manner in which it is laid, and its colouring may be the means of forming the first impressions on the mind of a prospective buyer.

ASBESTOSLATE

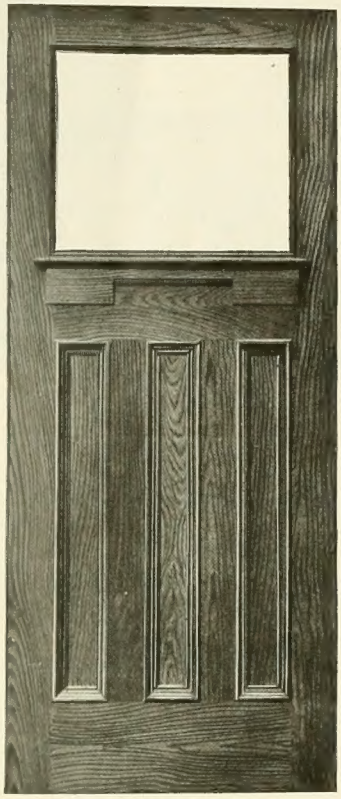
Asbestos Cement Shingles

will make those first impressions favourable ones. This roofing material imparts a destinctive but quiet individuality to the whole building. Furthermore, it offers to the seller of that building exceedingly strong arguments, for the reason that such a roof is wind-proof, water-proof and fire-proof. The owner will never be put to the expense of painting or staining it, and it is practically everlasting without the need of repairs. It is arguments of this kind that clinch many a sale.

How about the roofing material for the houses ***YOU*** are building? Why not write for our illustrated Booklet which will give you full information?

The Asbestos Manufacturing Company, Limited

E. T. B. Bldg., MONTREAL. Factory at Lachine



D-130

WHOLESALE **DOORS** RETAIL

This cut shown is put up in Clear and No. 1 grades.

Specifications:

Clear—RAISED MOULD ONE SIDE, SOLID MOULD ONE SIDE, FLAT PANELS.

No. 1—SOLID MOULD TWO SIDES, RAISED PANELS.

Our stock inside doors are six cross, flat panels and four panels (one cross top, two upright and one cross bottom). Put up in No. 1, 2 and 3 grades. Our grades are much above the standard.

Write for catalogue. Can ship immediatley

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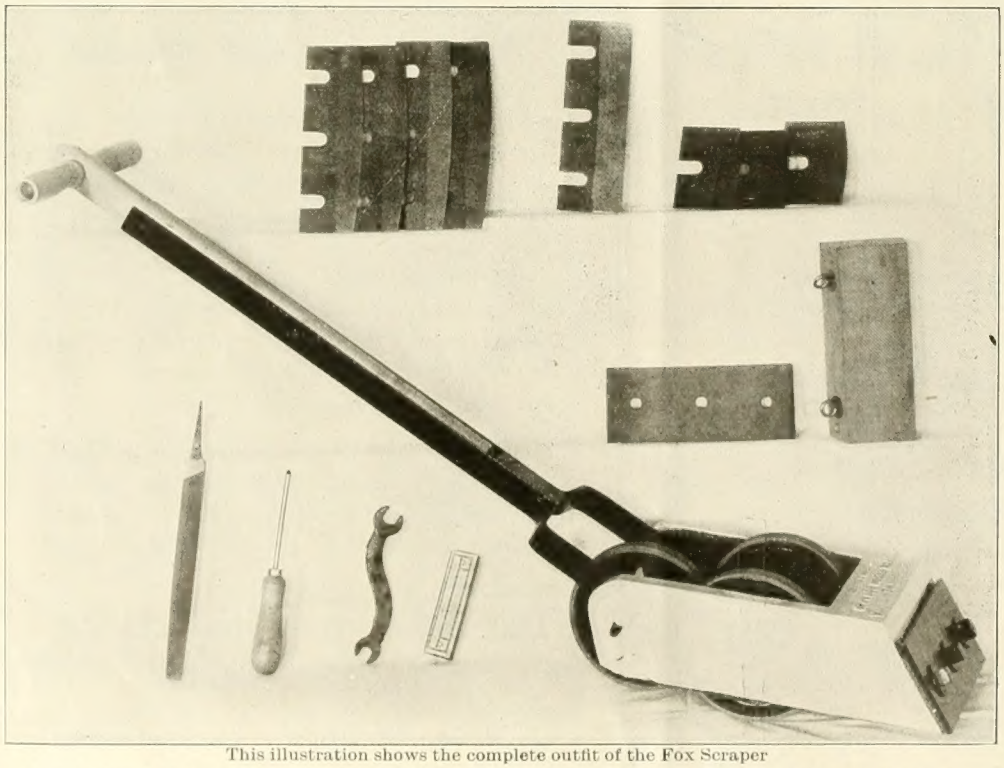
The FOX FLOOR SCRAPER Will Increase Your Profits



This illustration shows the complete outfit of the Fox Scraper

Manufactured under the Fox Patents by **FOX SUPPLY CO., Brooklyn, Wis., U.S.A.**

Doesn't this appeal to you?

EASY TO OPERATE

SCRAPES A FLOOR PERFECTLY

NO REPAIR TROUBLE
because it's as simple as a scraper can be be made.

SMALL INVESTMENT
a good scraper can't be sold cheaper.

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The Fox Scraper is sold in Canada by

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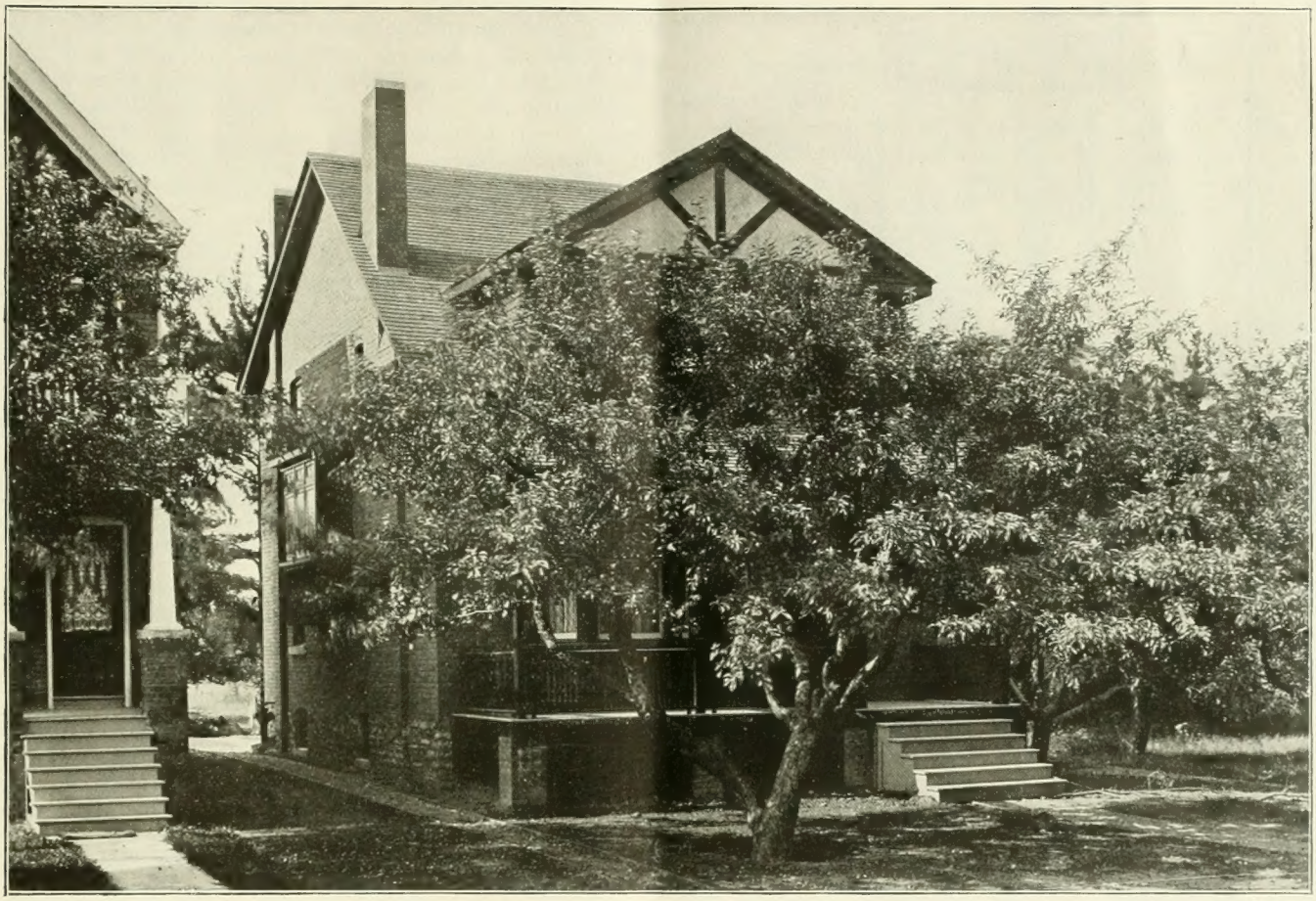


Specifications for Detached House on Albertus Avenue, Eglinton, Total Cost $3,500 : :

Built for H. E. Stiles, Esq.
Architect, J. Hunt Stanford, Toronto

SPECIFICATIONS and costs are here given, complete, for a detached house built in Eglinton, Ont. These specifications will not only give complete information on this house but assist the builder in drawing up his own specifications.

Mason and Brickwork.

Excavating: Excavate to the required depths, protect footings from damage by inclement weather, and roughly grade surplus earth around lot.

Footings: All walls, piers, chimneys, etc., to have cement footings 6 inches thick and 6 inches wider than walls above them.

Basement: The walls of basement to be 16 inches thick and to be carried up to the height of ground floor line in rubble stone properly bonded with mortar joints well flushed up. Exposed stonework to be tuck-pointed on sides and front.

Superstructure: Build brick walls as indicated on drawings. All external faces of walls of the building to be built with hard red stock bricks laid in colored mortar. Bricks for facings to be dark color and selected, and all work to be built English bond with one course of headers to five of stretchers.

Flues and Chimneys: All flues to be properly formed and to have a coat of plaster of mortar on the inside. Provide and fix all necessary soot doors and stove pipe collars. Form ash flues from fireplaces. The last twelve courses of chimneys to be built in cement mortar. Chimneys to be carried up as shown on drawings with stone caps.

Generally: Bed all plates, lintels, etc. Do all necessary cutting, etc., and all beam filling. Build in and properly point all window and door frames. Form all brick arches where shown on drawings and form arches over fireplaces. Build 14-inch x 14-inch piers in cellar on proper footings.

All openings to have brick relieving arches over.

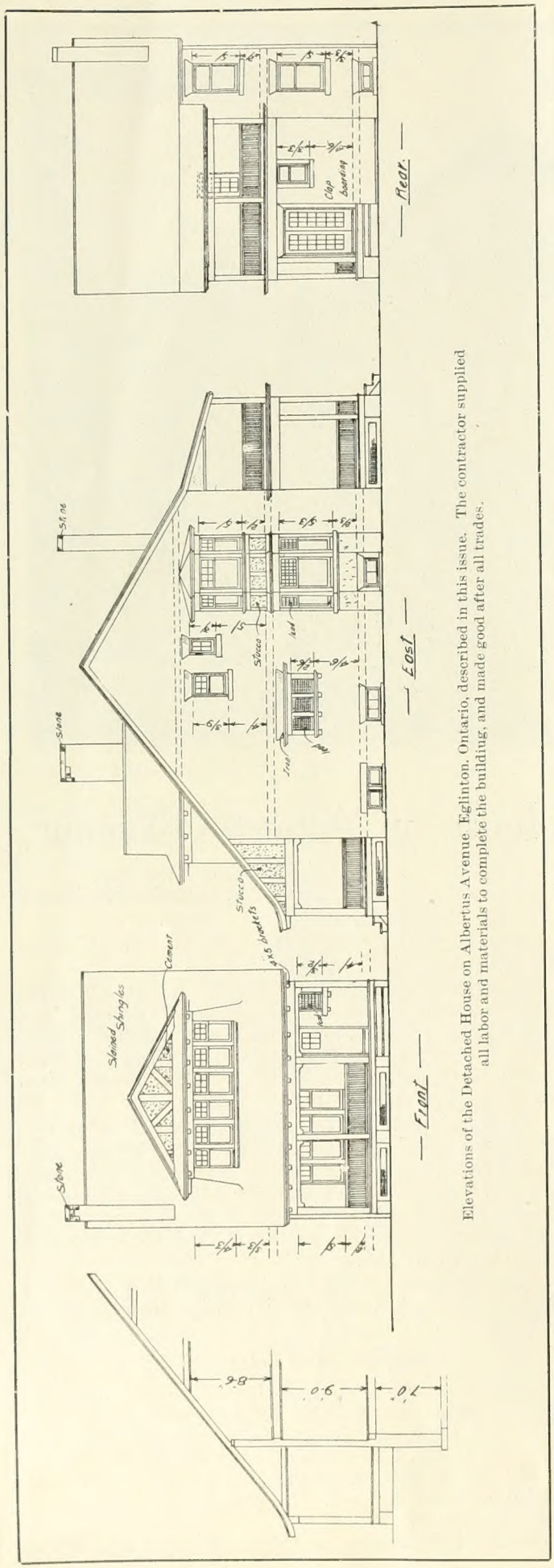
Stone: Stone to be Indiana with a rock face. Provide and fix sills to all window openings (except dormers and oriels) to be 6 inches x 8 inches and 9 inches longer than openings. These sills are to be weathered and throated. Provide 4-inch x 12-inch stone heads to openings where shown.

Brick Mantel: Build red pressed brick mantel and hearth of simple design to hall, with 4-inch x 4-inch red tile hearth.

Carpenter and Joiner Work.

Quality: All materials to be the best of their respective kinds, and suitable for the purpose for which they are required. Rough lumber for the carpenter work to be No. 1 dry hemlock, lumber for joiner work to be No. 1 kiln dried white pine. Oak to be kiln dried straight cut red. All trim, doors, etc., to be hand smoothed.

Sizes of Materials: 2-inch x 10-inch floor joist to



Elevations of the Detached House on Albertus Avenue Eglinton, Ontario, described in this issue. The contractor supplied all labor and materials to complete the building, and made good after all trades.

ground floor, 2-inch x 8-inch to first floor, and 2-inch x 8-inch balcony and varandah joists:

Beam in cellar	10″ x 8″
Rafters	2″ x 6″
Straps	1″ x 2″
Cambered Lintels	4″ x 6″
Ceiling Joists	2″ x 4″
Studding	2″ x 4″
Roof Plate	2″ x 6″

Double all joists around openings. Double studs around openings and at angles. All studs, joists, etc., set at 16-inch centres.

Flooring: Cover the kitchen and pantry floors with No. 1 7/8-inch pine T. & G. flooring, in narrow widths, 4 inches wide. The floor of main hall, dining-room and drawing room to be covered with 7/8-inch hemlock and finished with 3/8-inch T. & G. plain oak flooring in narrow widths. Cover the entire first floor 7/8 maple. Verandah floors to be 7/8-inch to 1-inch pine in narrow widths, 4 inches wide. Balcony floor to have No. 2 pine floor, covered with heavy duck canvas laid in paint.

Doors: Outside door frames to have solid rebated frames with oak sills. Inside doors to have 7/8-inch linings with stop planted on. All outside doors and ground floor doors to be 1¾-inch and other doors 1⅜-inch planted mouldings. Outside doors to be as shown, and interior doors to be four or five panelled. Cellar doors to be 7/8-inch batten. Front door to be venerred oak. Bedroom doors to have 1⅜-inch fanlights over.

Windows: Cellar windows and elsewhere where indicated to have 1⅜-inch casement sash in rebated frames. All other windows to have 1¾-inch double hung sashes in box frames, and fitted with pulleys, cords and weights. Projecting windows to have moulded wood sills and inside linings. Form cornices over same as shown. All windows to have moulded hanging styles.

Stair: Build the main stair, hand rail and newell post to first floor in selected oak. Newells to be 5 inches x 5 inches, hand rails 3½ inches x 2¾ inches moulded, balusters to be 7/8 inch x 1⅜ inches, strings to be 1⅜-inch, treads to be 1⅜-inch Georgia pine, risers to be 7/8-inch Georgia pine. Cellar stairs to be in pine with plain hand rails.

Cupboards: Build the cupboards in the pantry in two heights, upper portion to have 7/8-inch panelled and sliding doors and three shelves; lower portion to have four drawers and below same enclosed with 7/8-inch V sheeted doors; cupboards to run up to ceiling. The arrangement of these cupboards to be to owner's design, but not to cost more than the cupboards built in the ordinary houses in general.

Medicine Cupboard: Build medicine cupboard in bathroom about 2 feet 3 inches x 1 foot 9 inches.

Cellar, etc.: Cellar partitions to be of stud, sheeted one side with 7/8-inch matched hemlock. Fix shelves in cellar as shown.

Clothes Closets: Fit up clothes closets with one wide shelf, one rail and ten hooks.

Shingles: Cover the roof with B. C. shingles laid 4½ inches to the weather on asbestos. These shingles are to be stained by painter.

Rear Verandahs and Balconies, etc.: Verandah and balcony to be built as shown on drawings. All the steps to have 1⅜-inch slatted treads. Ceilings to be 7/8-inch Georgia pine. Balusters to be 1⅜-inch x 7/8-inch and 2 inches apart.

Trim: Fix 10-inch moulded base to the ground floor, except kitchen.

8-inch ditto to first floor.

6-inch chambered base to the clothes closets.

3¾-inch mitre basings to the kitchen and the pantry.

Mantel head casings to the ground floor and first floor with 6-inch capped heads and 4-inch square architraves and with a small neck mould on heads and 1⅛-inch base blocks. Fix 4½-inch chambered S. P. plate and picture rail in dining room.

All trim to be clear pine for stain, paint and grain to suit owner.

Fix quarter round to all base.

1⅜-inch moulded window stools with aprons under to all window openings.

Furring: Fur down for plasterer wherever required.

Hardware: Proprietor will furnish all finished hardware, such as locks, fastenings, furniture, etc., and contractor will fix same. All rough hardware will be supplied and fixed by the contractor.

Mantels: Fix a 2¼-inch shelf to brick mantel in hall. Other mantels will be supplied by owner. Contracted with builder for 2nd red pressed brick mantel as attached below.

Dadoes: Fix in kitchen a V sheeted dado 3 feet 6 inches high, and ditto in bathroom 4 feet high, set on a 6-inch square base, and finished with moulded capping.

Milk Cupboard: Form milk cupboard where shown with two doors.

Iron Work.

Iron: All to be 26-inch gauge. Provide and fix all requisite flashings, aprons, ridge, valleys, and all other iron work necessary to make roof watertight. Main eaves to have 5-inch trough and eaves to verandah. Bay windows and dormers to have 4-inch ditto. Well flash up chimneys.

Down pipes to be 4-inch corrugated and properly connected to drains.

Cover projecting window with iron on stairs and in hall.

Plumbing, Gas Fitting and Drains.

Gas Pipes: Lay to one point in each hall, two in basement, and one to bathroom, tested gas pipes of best quality and if sufficient size for purposes intended. Also run separate branches for gas stoves in kitchen and for all mantels with stop cocks on all services to grates.

Water: Lay in from street line ½-inch galvanized iron pipes to inside of front walls, and carry ½-inch galvanized pipes to supply all fixtures throughout buildings. Place on service on entering cellars ½-inch stop cock and form separate branch for watering lawn with ½-inch stop cock and ½-inch hose cock.

Soil Pipes: Provide and fix up 4-inch cast iron soil pipes with branches for all fixtures, first quality medium weight and run same up through roof to 3 feet above all openings, all joints to be made with oakum and run with molten lead and caulked perfectly gas-tight. Run cast iron vents to points above fixtures in bathroom. Soil pipes to be properly connected into tile drains with Portland cement.

Flash: Where pipes go through roof same are to be made watertight with heavy sheet lead flanges.

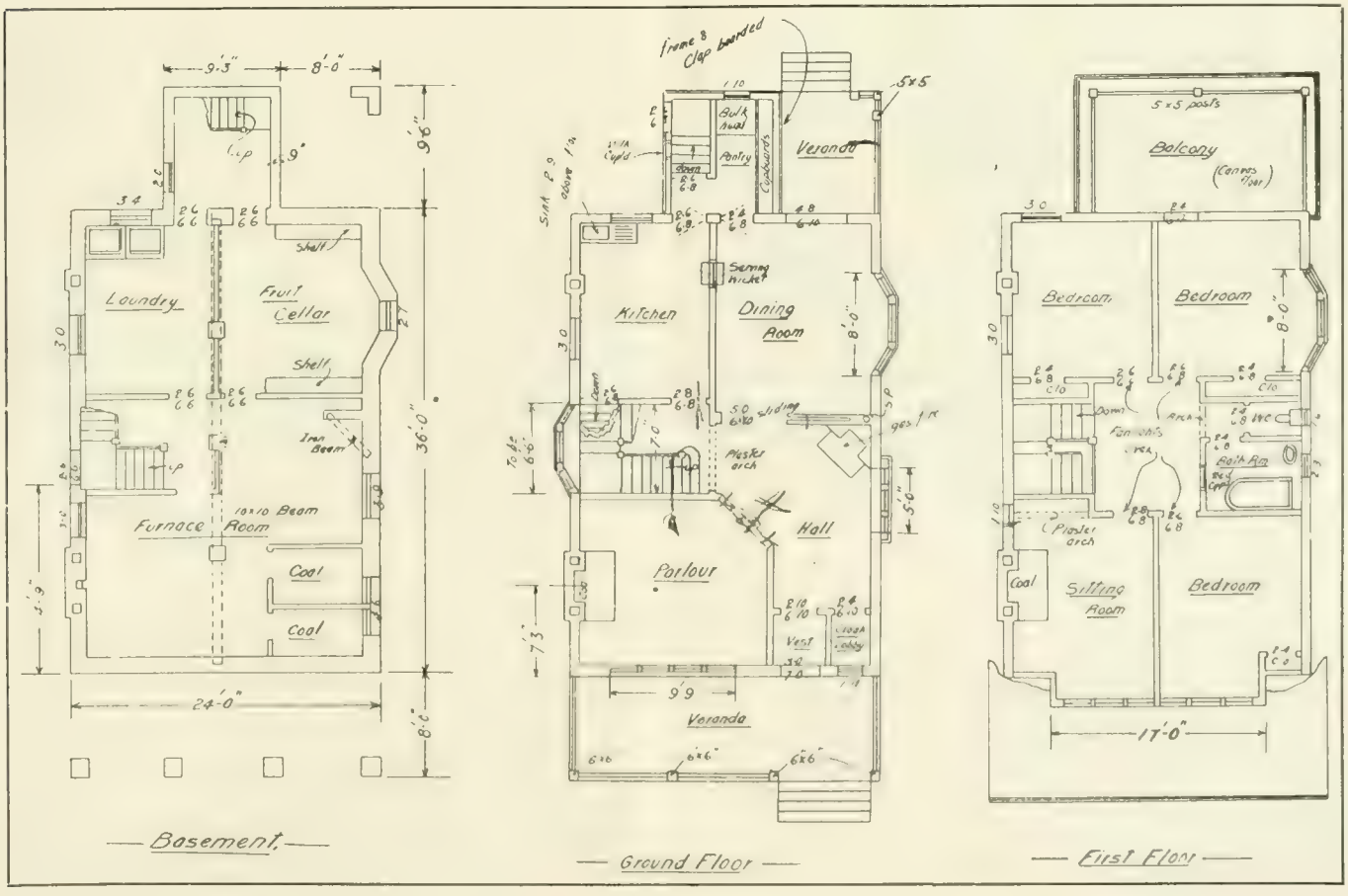
W. C.: On the first floor fix a Wolverine reversed trap closet, with oak copper lined tank.

Lavatory: Provide and fit up in main bathroom one Standard Pedestal lavatory and fitted with hot and cold supplies and "Fuller" basin taps.

All fittings, exposed pipes in bathroom to be nickel plated.

Bath: Fit up in bathroom a 5-foot enamelled roll rim bath and fitted with "Fuller" fittings.

Sink: Fit up where shown 18-inch x 30-inch white enamelled sink with rolled rim and back and enamelled



iron drip board. Provide same with hot and cold water, "Fuller" taps.

Boiler: Fit up in basement one 30-gal. galvanized iron boiler with cast iron stand placed where shown. Supply all necessary couplings, sediment cocks, etc., and have a ½-inch cock on all supplies. From boiler carry ½-inch galvanized iron pipes to supply all fixtures with hot and cold water as required. Plumber to provide and fix a domestic ring in furnace and is to connect up with same.

Laundry: Provide and fix in laundry two C. I. enamelled laundry tubs, set on C. I. stands, and fitted with brass compression taps, one to have a faucet for hose.

Local Vent: Closet to have a 3-inch galvanized local vent carried into nearest chimney.

Painting and Glazing.

Generally: Knot, stop and paint three coats all inside and outside iron work usually painted, including outside floors unless where otherwise specified. Genuine white lead only to be used.

Graining: Grain and varnish the kitchen and pantry, and woodwork in main hall.

No roof finish to be included in this specification.

Stairs: Fill, shellac and finish the stairs.

Sitting-room: Stain the woodwork of sitting-room with a brown "Solignum" and shellac same and finish complete to suit owner.

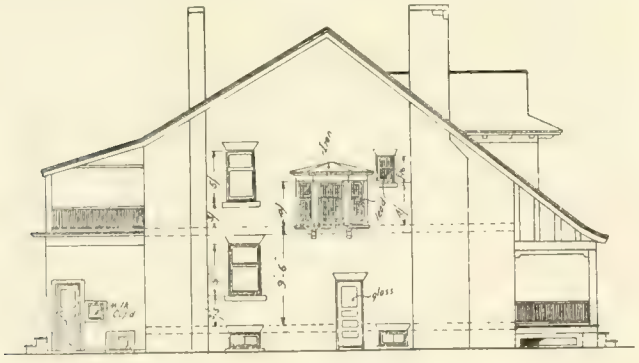
Hardwood Floors: Fill, shellac and finish the floors, finishing the floors by staining to suit owner.

Shingles: Stain shingles with a creosote stain of approved color.

Glazing: Provide and fix the following glass and keep in repair till completion of job:—

Six 1½-inch bevelled plates to front door.

Leaded glass at 45 to 60 cents per foot to owner's



Elevation of West Side of $3,500 detached house.

selection to upper sashes of dining-room window, window in hall, and also on staircase and cloak lobby and vestibule door.

Double diamond glass to be used, except the front doors, plate glass to be put in.

Lathing and Plastering.

Note: Render all outside walls with a good coat of mortar.

Lath: Lath all outside walls, partitions, ceilings, stairs, soffits and other places prepared for lathing with 2 hemlock or pine lath well nailed with ⅜-inch joints and in 18-inch panels.

Plastering: Plaster all walls, ceilings, soffits, etc., throughout ground floor and first floor with the best two coat work, hard finish, free from cracks, blisters and all blemishes.

The first coat is to run tight against all frames and down behind bases and dadoes.

Coves: Form covered ceilings in parlor and dining-room on pine or hemlock.

Generally: Plasterer is to leave all floors broom clean and clear away plasterer's rubbish, make good after all trades at completion of the building.

Inside Stucco: The ceiling and cove of dining-room and ceiling of sitting room to be finished in floated stucco.

Outside Stucco: Panels in front dormer gable to be finished in rough stucco, also end panels to verandah and under side bay.

Electric Wiring.

Pay all inspection fees.

All work to be in accordance with the requirements of the Board of Underwriters.

Provide and fix conduit, knife switch, cut out plugs and all switches. All outlets (except bathroom) to be in centre of ceiling.

Wire for the following outlets: there is to be only three flush switches. Installed to suit owner.

3 lights, 1 controlled by snap switch in ground floor.

7 lights, 3 controlled by flush push switches, and hall light controlled by 2 3 way switches.

Bells: Fix up bell service with separate bells to ring front door and back door.

Heating.

Provide and fix a Pease "Economy" hot air furnace of requisite size to heat house to 70 degrees when temperature outside is at zero, and give guarantee to this effect. Fix cold air register and duct of necessary size. Run leads to heat all rooms and main hall, and fix registers in walls in all cases. Downstairs registers to be the "Auer" or similar design.

Drains: The contractor is to prepare a temporary septic tank with drains all complete to be built so that it will bear inspection and pass by an inspector of the health department.

Complete Cost of House.

7¼ tons of stone, $17.00 (for cellar)	$123.25
2 beds mortar, $15.00	30.00
Labor	82.75
26,000 brick, $13.00, including hauling	338.00
3 beds mortar for the bricks, $15.00	45.00
Wages for brick work	191.00
Plumbing, 2-piece bath and 3-piece toilet, 30-gal. boiler, Fuller tap, dip board, 2 laundry tubs, all white enamel, and quarter cut oak closet	210.00
Painting	140.00
Concrete, cellar floor	56.00
Excavating	30.00
Electric wiring	43.50
Tinsmith	42.00
Drains (connection to sewer, etc.)	66.00
Glazing	596.00
Lumber, Georgia Pine trim downstairs throughout	1,025.00
Labor for carpenter	150.00
Grading, earth, etc.	18.00
Rudd heater	105.00
	$3,399.15
Extras—2 mantels, 1 brick, 1 walnut, $50 and $25 each	75.00
	$3,474.15
Plans	25.00
	$3,501.15
Surveying	9.00
	$3,510.15

The Use of Hollow Clay Blocks for Farm Buildings : :

By M. L. King

Some important points to be considered—Barns, Houses, Storage Buildings, Corn Cribs, Etc.—Figures of Cost.

Paper by M. L. King, experimentalist at the Iowa State College, read before the American Society of Agricultural Engineers.

TIME, time, energy and money spent in the design, construction and repair of farm buildings each year is so great that the importance of the problem of farm buildings stands second to none, except perhaps a very few of the most fundamental problems of conservation. The three principal classes of building materials are lumber, metal and masonry. The present prices and lasting qualities of masonry bring it to the front at this time. The inexhaustibility of the supply assures the most extensive use of it in the near future. The special and remarkable advantage of the use of a small amount of metal combined with masonry brings us to the conclusion that reinforced masonry will be the building material of the future.

Clay products have always been among the most widely distributed and used of masonry materials. The development of hollow clay blocks has reduced the labor of manufacture and laying up, lessened the amount of material used and at the same time improved the quality of the product. For building walls of small to medium sized buildings where permanence, warmth and medium cost are desired the clay block is worthy of more than passing attention.

Construction of Hollow Blocks.

In general, hollow clay blocks are made of the same material as building brick. The quality may be judged from considerations similar to those used in the judging of building brick. The clay is forced through dies and is subject to the same danger of stratification as brick.

The most common sizes are 4 x 4, 4 x 5, 4 x 8, 4 x 12 and 5 x 8. The length is generally 12 inches, but 16 inches and even greater lengths are common. The air spaces are not generally greater than 4 inches in any cross-sectional dimension. In the heaviest blocks the air space is merely large enough to insure the passing of the fire down through the block while burning. For use in medium sized buildings, however, ½ to ¾ inches is most common and sufficient thickness of the clay.

The strength of clay bricks is remarkable. Tests of medium quality blocks show a strength from 1,000 to 6,000 lbs. per square inch. Its strength is often equal to that of solid brick on account of the fact that the hollow is burned more uniformly. So far as downward pressure is concerned it would probably be safe to build a wall of this material of uniform thickness to a height of 4,000 feet.

A rather unusual, although perfectly safe design in which strength of this material was quite fully utilized, was that of a silo 18 feet in diameter and 54 feet in height having a reinforced wall which has for some time successfully supported a 600 bbl. masonry tank.

There is no building material more impervious to water and air than vitrified clay. From absolute dryness to saturation requires an absorption of less than 5 per cent. of its weight of moisture.

In regard to its fireproof qualities, the following is quoted from the highest authority:—

"Terra cotta will certainly require less reconstruction after a severe fire-and-water test than any building material except possibly the best quality of fire brick." "In Baltimore and San Francisco fires it was demonstrated that for outside walls brick are superior to any other material used in wall construction." In buildings which are to contain large quantities of inflammable material it is undoubtedly better to line the walls with porous furring or hollow brick.

A rather interesting test along this line has been going on in the writer's house for the last two winters. We have a fireplace built of 4 x 8 x 12 shale clay blocks forming a 1-inch wall. We have burned wood, soft coal, hard coal and coke in this fireplace. The inner walls have often been white hot, yet not one of the blocks has been checked although the expansion of the hot blocks has sheared the mortar loose from the foundation.

Clay block walls thick enough to sustain any downward pressure which comes upon them will often not be rigid enough to safely withstand the side pressure or shearing strains which may be imposed.

Stresses in Houses.

In dwellings the principal stresses to consider are due to side pressure of winds, freezing ground in contact with the cellar walls, outward pressure of roof and shear due to unequal settling. In barns and other buildings in which large stock is kept the crowding of the stock should always be considered in addition to the forces already mentioned in dwellings. For storage buildings the different materials to be stored must be considered. There are reliable sources of information concerning the pressure of these materials.

In regard to the danger of stock crowding masonry walls I was interested in finding a clay block blacksmith shop located in the northern part of Iowa. This shop was some 30 feet wide and some 50 feet long. At the front end the walls were 12 feet high, sloping to 9 feet at the back end. They were 8 feet thick and contained no reinforcement. Alongside of this shop and secured to the wall were 13 tie rings. Frequently to all of these rings have been secured horses waiting to be shod. Halter pullers have repeatedly broken ⅝-inch ropes secured to them and the wall has not been injured in any way.

Instead of an 8-inch wall in this shop a 5-inch wall could have been made fully as strong and more cheaply by reinforcing it. In reinforcing a straight wall against flecture there must be side supports. Joists may be utilized for tying walls together. In the absence of other supports reinforced pilasters may be built into the wall. All corners must be thoroughly tied into the wall with good wall ties.

Horizontal reinforcement may generally be placed in the mortar joints to the best advantage, but in some

cases, such as over windows and doors, a hole may be broken in each block at the top and steel extending through the blocks may then be secured by pouring the block full of concrete.

The most convenient size of reinforcement to use for mortar joints is No. 3 wire, which is ¼ inch in diameter. Sometimes the greater availability of No. 9 wire may recommend its use, and for reinforcing blocks which are filled with steel and concrete any convenient size of steel may be used.

House Construction.

Clay blocks have been used to quite an extent in the construction of houses. The usual method is to lay up an 8-inch wall, such as is ordinarily used in cement block house construction. The objection to this method is that while the walls are entirely windproof, there is considerable heat carried out through the walls on account of the mortar and clay extending from the inner to the outer surfaces. Also there is always the probability of a small amount of moisture being conducted across by the mortar. In ordinary house construction 8-inch walls are much thicker than necessary and two 4-inch walls can be built from the same amount of material and slightly greater amount of labor.

For the last two winters the writer has lived in a story and a half house having a 4-inch wall built of these blocks and is at present designing another to be occupied permanently. The whole house will be made of 4 x 8 x 12 inch blocks. This will facilitate sorting blocks. The cellar wall will be 8 inches thick, with soft and slightly checked blocks below the frost line and hard, dark blocks above the frost line. Between the frost and grade lines may be used any hard blocks which may be off in color. From the grade to the first floor line dark blocks need only to have one 4-inch surface free from checks. Above the line of the first floor will be two 4-inch walls with a 2-inch air space between. All window and door frames will be rabitted on the back and concrete slugged in between the end of the block and the frame. This insures windproofness around the frames. If it can be conveniently done tar paper will be placed in the mortar joints of the inner wall and hung down full width to a mortar joint in the outer wall. This makes one more dead air space and increases the certainty of the wall being moisture proof. Each wall will be sufficiently reinforced to stand independent of the other. In order, however, to stay the green walls while building, some wall ties will be used but only temporary dependence will be placed in them. The blocks of the outer wall will be of uniform color laid up in mortar of the same color. The inner walls and partitions may be built of blocks not fit for other purposes. Thus it will be seen that kiln run material may be used.

Blocks of Uniform Color.

In case blocks cannot be secured of so uniform a color as to give the house a desirable appearance it can be stuccoed or painted. Though appearance is desirable it is not essential, and there is no place where the beauty of utility is so fully appreciated as it is on the farm. Thus the fact that we are unaccustomed to the appearance of the block construction is of less consequence for farm buildings than other. In addition to this I am firmly of the opinion that with a fairly uniform colored block and a colored mortar with a few vines growing up around the corners the longer one lived in such a house the more he would regret leaving it.

Small clay block barns are rather common in town, but large or even medium sized barns economically built are scarce. It is easy to find places where men have squandered fortunes riding an agricultural hobby, but such things have little or no bearing on every-day farming.

In the northern part of Iowa there was during the summer a medium sized dairy barn built of hollow blocks. The walls are 8 inches thick below the hay mow floor and 5 inches thick above. The roof trusses were so designed as to prevent any outward pressure on the walls. The foundation is reinforced so as to prevent any settling cracks. Some steel is also placed in the corners and over the door and window frames. The builder of this barn reports that the cost was fully as low as other dairy barns in the same neighborhood which were sheathed.

Storage Buildings.

In storage buildings of any kind the outward pressure of material can be most conveniently provided for if the building is round, as the walls are then in direct tension and the material depended upon to hold it is not so seriously stressed as though the walls were in flexure. In most cases reinforced concrete door frames can be joined to the reinforcement of the walls, thus eliminating all material less permanent in character than concrete and vitrified clay. Silos built of this material have already been in use several years. They have been perfectly satisfactory and are becoming very popular. In the fall of 1908 one silo of this type of construction was built and successfully operated. The following year 12 more were built and a bulletin issued showing their construction. During the past summer about 125 have been built. So far as we can learn they are all in successful operation and none of those built from the bulletin have been more expensive than a good grade of stave silo.

Corn Crib Construction.

A few corn cribs of this material are also in use. If built circular it is a very simple matter to lay some steel in the mortar joints and form a reinforced concrete door frame. In building rectangular cribs the reinforced concrete door jambs may extend to the top of the crib and may be tied across the top and bottom to pilasters on the opposite side of the crib. It then becomes a problem of reinforcing the straight walls against flexure due to pressure of the material inside.

For corn cribs the blocks should be laid crosswise in the wall, and the air space should extend from the inner to the outer surface. It seems to me that the best form of material for this purpose will be a special block made as large as possible but cut short and on a bevel so that in laying them up the cut ends may form a smooth vertical wall, but the air spaces slope down and out, thus carrying away a large portion of any rain which would otherwise be driven in by wind.

A few larger elevator bins have been built of this material, and superintendents of wide experience say that they have never had any that kept the grain so thoroughly dry.

For various other small buildings about the farm, such as chicken, hog, smoke or dairy houses, the blocks are cheap, easily laid up, sightly, and easily kept sanitary. They provide no hiding places for insects or pests of any kind.

Figures of Cost.

Hollow blocks are generally sold in brick measure, 72 cubic inches allowed for a brick. In manufacturing

the amount of material used is very much less than that for brick. The selling price at the factories will range from one-half to two-thirds that of a similar grade of brick. The cost of manufacture is perhaps slightly increased by the fact that a greater variety of dyes and therefore forms of blocks need to be carried in stock than is the case with solid brick. A common price f.o.b. cars at plants in Iowa for kiln run is $4.50 to $5 per M brick measure. The cost of buildings will, of course, vary with labor conditions and local supplies of sand, etc. My experience has been that for medium sized buildings the labor conditions of the rural communities and small towns are better than the cities. The mechanics of these localities must necessarily do a variety of work and the average farm building is not large enough to make advantageous use of specialists. There are so many figures that can be given tending to show the low price of any particular material which is desired to be shown favorably, therefore I will quote but few figures. The following is from a booklet by the Pennsylvania Fireproofing Co., and though catalogue material, it is far from common practice.

Hollow tile walls per 100 sq. ft., cement stucco and interior plaster.

6 inches	$23.85
8 "	27.10
10 "	30.85
12 "	32.35

Exterior plain, interior plastered.

6 inches	$18.35
8 "	21.60
10 "	25.35
12 "	26.85

Exterior plain, interior ready for plaster.

6 inches	$15.50
8 "	18.75
10 "	22.50
12 "	24.00

Partition walls ready for plaster.

3 inches	$10.50
4 "	11.00
5 "	12.80
6 "	13.10

In silo construction a reinforced wall neatly painted outside and washed with cement inside will cost from $13.00 to $15.00 per square, $14.25 being very common.

A builder in Wilkes-Barre, Pa., recently decided to practically determine the question, and to that end he erected in the same locality three houses of the same size and arrangement. One house was built entirely of wood, the second was of concrete with wooden floors, and the third was of hollow tile blocks and concrete. When the experiment had been completed it was found that the cost of the wooden structure was $6,000, the one of tile and concrete was $6,500, and the one of concrete was $8,900. The builder regarded the tile and concrete house as the cheapest, so far as durability was concerned. He also regarded it as likely to be warmer in winter and cooler in the summer by reason of the air spaces in the hollow bricks being poor conductors of heat and cold.

It is, of course, advantageous to use standard blocks when possible. However, special dies are not very expensive and manufacturers will make anything for which there is a market. In special stuff there is always room for careful consideration. In silos, for instance, a curved block was needed, and after considerable effort and some partial failures the blocks were automatically bent by simply running them out flat on curved instead of straight pellts. The pellets of the cutting table were alternately concave and convex. The column of clay from the die settles of its own weight in the curves, thus causing no extra labor. The ends are cut square so that they are set in the kiln just like any other blocks.

Prizes Awarded by Toronto Housing Co.

Two English architects collaborating, Sydney V. Kendall and Leonard Martin, F.R.I.B.A., of London, won the award in the competition conducted by the Toronto Housing Co. for plans of houses for the development of the land on Bain, Sparkhall, and Logan Avenues. The judges were Mr. Eden Smith, Mr. J. C. B. Horwood, and Mr. Henry Sproatt.

They place first of the designs these competitors' plans for a block of four houses, marked Block D, 7 rooms.

Next their design for a pair of six-roomed houses, and their plan for a single seven-roomed house.

Mr. G. Frank Beer, president of the Housing Co., in a statement explained the objects of the Toronto Housing Company's scheme:—

"A good deal of misinformation seems to be abroad in regard to this undertaking. The work is of such importance to the community that every citizen should be informed in regard to it. Housing is the most difficult form of improvement work, because, while it is essentially social in its aim, it is of necessity, in form, a business undertaking. On a scale to be effective it must involve a very large amount of capital.

"The company was incorporated and looked about for suitable land. The vacant tract on Bain, Spark hall, and Logan Avenue, opposite Withrow Park and close to Riverdale Park, was brought to its attention. The area according to the Assessment Department, was 228,300 square feet, not including streets. It is low lying, dish-shaped, and had it been sold by the city a lot at a time the development would have been very unsatisfactory, because only very poor houses would have been put on the low ground, especially in view of the fact that Sparkhall Avenue in this part, is a one-sided street.

"The landscape architects, Messrs. Dunnington, Grubb, and Harries, planned the land to accommodate one hundred houses. One 228,300 square feet of land that would mean on an average 2,283 feet of land per house, considerably more than 2,000 square feet, which is the area of a lot 20 x 100, and that is considerably more than the average area of workingmen's lots in Toronto.

"The development if carried out on the lines planned by the company will make the district one of the show places of the city. The plan calls for the diversion slightly of Bain and Sparkhall avenues.

"Some objection has been made to the fact that the land has been laid out in shallow lots. The question from a housing point of view, which means the health and comfort point of view, is not the depth of lot, but the area of land per house. In order to obtain pleasing architectural effect it is necessary to have the lots wider than ordinary. Land is too expensive to have them both wide and deep.

"The company hope to commence building operations this fall, but there is at present very great scarcity of building material."

Mr. S. V. Kendle, who was in Canada last spring, expects to again visit this country about October 1, when

his plans will be discussed. The estimated cost of the houses is from $1,200 to $2,100 to rent from $12 per month up.

In awarding the prizes the judges had in view economy of construction, suitability of plans and architectural merits of designs. The Toronto Housing Co. will standardize everything and thus reduce cost of construction, and not by using anything of an inferior quality. The prize plans and some others which were submitted will be published in an early issue of The Canadian Builder.

Reasons Given for Licensing Architects

From a very carefully selected list of questions submitted to the various examining boards in the States of Illinois, California, New Jersey, Colorado, Louisiana, Utah, as well as Manitoba and Quebec, Canada, the following reasons have been deduced in favor of licensing architects, says Brickbuilder. Architects in States where such laws exist are unanimously in favor of it. The law has helped the profession by removing the "architect and contractor," the "architect builder" and the "architect and engineer." Many State universities and technical schools have, since the advent of the architects' license laws, revised their courses to meet the demands. The law has created a higher moral standard, as well as competency in planning and designing. The preparation for a license examination is highly beneficial to the applicant. The law furnishes a standing for the licensed architect and reveals to the people the unlicensed and questionable man. The salutary effects towards better architecture where such laws exist are immeasurable, resulting as it has in the elimination of inexperienced and incompetent men.

The Why of Opaque Windows

The building contractor let loose some of his most emphatic phrases when he found that the man who had been hired to daub whiting all over the windows had not half done the job, recounts the New York Times.

"That man doesn't seem to understand what the windows in a half-finished building are whitened for," he said. "He don't plaster them over with chalk to prevent the public from seeing the unfinished condition of the interior, but to keep the workmen from battering out the glass. Transparent glass looks just about as transparent air to the man who is moving a wooden or iron beam in a hurry, and he is likely to ram the end of it through an expensive window, but when the glass is coated with white it becomes visible and the workmen hand their material in through the door."

Cost of Fireproof Construction

In discussing the question of "Fireproof Construction" before an audience at Orange, N.J., Philip H. Bevier, C.E., gave the following interesting figures as to the comparative cost, and arguments as to public and private desirability:

"At the present price of building material, fireproof construction can be erected at a cost not to exceed 10 or 15 per cent. more than non-fireproof, and when we consider that a fireproof building deteriorates about one-ninth of 1 per cent. per year as compared to 4 per cent. for ordinary buildings; that they rent better and that money can be borrowed on them on better terms; that they are vermin-proof, cooler in summer and warmer in winter, it would certainly seem a part of wisdom and self-interest to adopt a better method in every case when the building is to be of a permanent character.

"When a man builds a house in the country it may be that he has a right to jeopardize his own life and property and those of his family, and gamble with the insurance companies, but there is no question that the owner of property in a city or town has no right to erect a structure that will be a menace to the safety of the property of the adjacent owner. This principle is clearly recognized in practice, and many of the smaller cities are adopting building codes requiring fireproof construction throughout a certain portion of the business section, and semi-fireproof buildings in less congested districts.

"If one-half of the money spent by American cities for fire losses was spent for better building construction, the annual loss by fire would soon begin to decrease. Improvement along the line of better construction, the annual loss by fire would soon begin to decrease. Improvement along the line of better construction can only come gradually. It can and should be hastened in thickly settled communities by stringent building laws. City officials must be awakened to their responsibilities and the individual shown that his own pecuniary interests lie in lessening the fire waste. Old buildings cannot be torn down at once and rebuilt, but we can see to it that no more fire traps shall be built where they are a menace to other structures."

Increasing Population and What it Means

"Canada's population is increasing swiftly," says Arthur I. Street, writing in September Canada Monthly, under the title of "How Many More?" "and with that increase will come a corresponding increase in business. For instance, nine and three-quarter millions more people mean a million and a half more dwellings, for one thing. A million and a half more places for people to live in—houses—things that require lumber and brick and mortar and nails, and plumbing, and workmen. Things, in other words, that make business, make occupation for men's money and capacities, make buyers for your wares, consumers of your wheat, users of your ingenuity.

"We get this figure of one and a half millions as we did the others. We size up the places in the United States that look like the provinces, but are older and fatter, and see how much they require for dwellings in proportion to the number of their people. Nebraska, for instance, has to have an average of one house for every five and a half persons, and Texas has to have one for every seven, and Colorado for every six. Evidently it takes just about that much roofing to keep the people of those sections of the United States in out of the wet and cold and to give them bed-rooms, dining-rooms, and places in which to do business. So, it ought to take about the same for us in Western Canada. Maybe a little more. And, if it did take the same, here's the way things would mass up:

New dwellings required in Manitoba for increased population	117,867
New dwellings required in Alberta and Saskatchewan	928,503
New dwellings required in British Columbia	440,560
Total required in Western Canada	1,486,930

The Bungalow Cottage that made a cheap but attractive Home.

How to Build This Bungalow Cottage for $3000

Not including Heating and Plumbing

HOW this bungalow can be built for $3,000, exclusive of heating and plumbing, is told in Keith's Magazine. The bungalow character makes the solving of the problem of low cost very difficult. Painstaking study and careful planning were therefore necessary to achieve a home like this for $3,000

The ground space occupied is 37 x 41 feet. The first story ceiling is 9 feet 5 inches high and the basement 7 feet 6 iuches. These heights utilize 10 feet studding on the first floor with single header at floor and double header plates on top. The first floor utilizes joists of 12 and 14-foot lengths, cutting to good advantage with 10, 12 and 16-foot lengths on second floor, and a few 18-foot lengths over living rooms. The roof rafters are allowed to project showing exposed ends and form the outside brackets under the roof, thus securing a pleasing effect at trifling cost.

Poured concrete is used for the foundation and basement wall of 12 inches thickness. The exterior is shingled to the roof. Chimneys are red paving brick, laid up in brown mortar.

The 10-foot wide porch upon two sides is a great luxury in such a low cost house, and is made possible by using simple squared posts for pillars and the plainest of 2-inch spindles set 2 inches apart.

The outside trim should be plain for both head and jamb casings, made of 7/8-inch boards 3½ inches wide.

All the interior finish is of yellow pine.

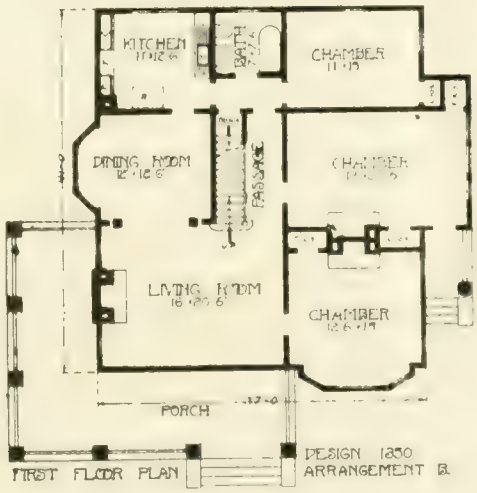
Detailed estimated cost exclusive of heating and plumbing but including fireplaces are here shown.

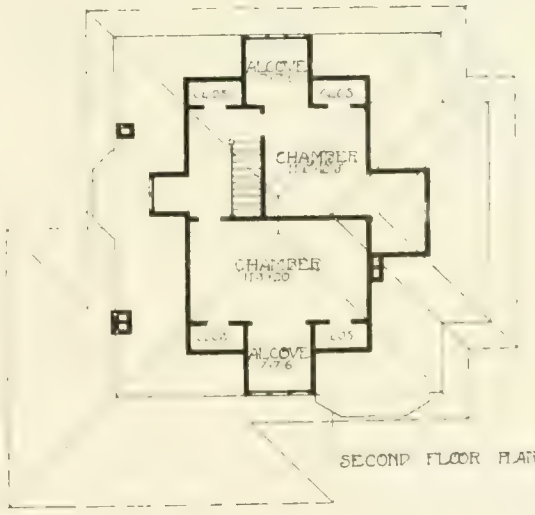
Excavating	$45.00
Foundation, including cement floor	310.00
Two chimneys, including three fireplaces	203.00
Millwork and lumber	1,005.00
Carpenter labor	503.00
Plastering, including materials but not 2nd floor	275.00
Painting and staining	263.00
Hardware	61.00
Electric wiring	30.00
Miscellaneous, including plans	55.00
Total	$2,750.00
Contractor's profit, 10 per cent.	275.00
Cost to owner	$3,025.00

If plumbing and heating are figured together with fireplaces add—

For plumbing	$235.00
For hot air furnace	165.00
Total additional	$400.00

Floor Plans of the $3000 Bungalow described on this page.





Keeping Track of Cost on Small Contracts

By E. F. Ryan

An accurate estimate of the material required for the proposed work is first made out in duplicate, the carbon copy remaining permanently in the book.

It is generally better to make out separate estimates for the material furnished by different lines of business, as for lumber, hardware, painting, etc.

If any of the labor is to be sublet, it is also made out in this same way and, in the absence of plans, a short description of the work and material required, if any, is given.

The name of the person for whom the work is to be done is also written on the estimate, and those giving prices are instructed to put this name on also. This keeps the material of one job from being confused with another, where the contractor has several jobs on hand at once.

The estimates being carefully prepared, the perforated leaves are detached and given out for figures, labor or material as the case may be, and are returned as soon as those bidding have secured a copy. As soon as prices are given on the material or labor, they are written on the carbon copies remaining in the book.

These, together with the cost of day labor, which should also be estimated in this same book, although a copy need not be made of it, form the basis of the price to be made on the building or contract.

If the business is secured, the loose leaves are used to check the material as it is delivered and for reference by the workmen; if the job is not secured, the price at which it was let could be entered in the estimating book for future reference, giving an idea of their competitor's figure on work to come up later.

In delivering an estimate, it is well if all of any one item could be placed on the ground at one time, thus if there is 100-2/4-16, it is much easier to check them at one delivery than several deliveries. Of course, this cannot be done with perishable material or where room is limited.

The dimension and sheathing, if possible, should all be at the building site before the carpenters begin work. These could be piled by the drayman so that they could be counted in a few minutes.

It is better to have the material delivered in as large loads as possible, as aside from the saving in drayage it is easier to check one large load than several small ones and with a little forethought this can almost always be done.

Where a few pieces are sent by a dray, the tendency is to forget to check it off at all. At first most contractors check up the deliveries quite carefully; as the work advances, many become more and more careless and in the end the inaccuracies are so apparent that the whole time spent in checking is wasted, as in case of dispute it would not stand in court. Where extras are needed, it would be well to make as few orders as possible by looking well ahead to see what is needed. These could be written on a small account book, the leaf torn out, and sent to the material man, then returned with the material and filed for future reference. An account should be kept of all material returned and in this same small account book.

Where men are employed by the hour they write out their time checks for signature and on the back of the check is the number of hours and the job or jobs on which the work is done. Payments for material are made by check and the job on which the payment to be applied is also written on the check. At the completion of the contract, statements from the firms furnishing material are requested. These are checked and errors, if any, corrected. The amount of the various statements are placed in the duplication book, with their estimated cost, for future reference. The checks for labor are handled in the same way. The cost of labor furnished by the different trades are totalled and placed with their estimated costs for future reference.

A contract handled in this way takes no bookkeeping work at all. The checks and statements show the entire transaction, how much and for what. The small contractor who works with saw and hammer himself cannot keep books where much bookkeeping work is to be done. In theory it seems possible and perhaps is possible, but in practice, not one in a hundred would keep an accurate account year in and year out, or on even one job.

In a vast majority of cases, the material men will furnish more accurate bills without any checking than will the average small contractor, who undertakes to work and do his own bookkeeping. However, it is desirable for the contractor to count and see that he gets what he pays for, as all men make some mistakes and some, if not watched, would be dishonest. Where a contractor works himself, the simplest and easiest way is best, because if there is much work or complication about the book work, it will be neglected.

As outlined above, this work is done mostly by the material men, and workmen, leaving the boss to simply verify their accounts.—The National Builder.

Homes for Workingmen at Windsor

In connection with Windsor's city-owned factory district, arrangements have been completed for the building up of a subdivision in the south of the city with workingmen's homes, suitable for men who are coming to the city to work in new factories. The problem of housing incoming workingmen was brought to the attention of the Board of Trade and city officials some time ago by manufacturers. This has resulted in the commencement of the erection, by private enterprise, of 50 well-built houses suitable as homes for the families of these newcomers. Property selected for the subdivision is on Pelissier Street and Dougal Avenue, a few blocks from the factory district.

Street Planning and the Tax Rate

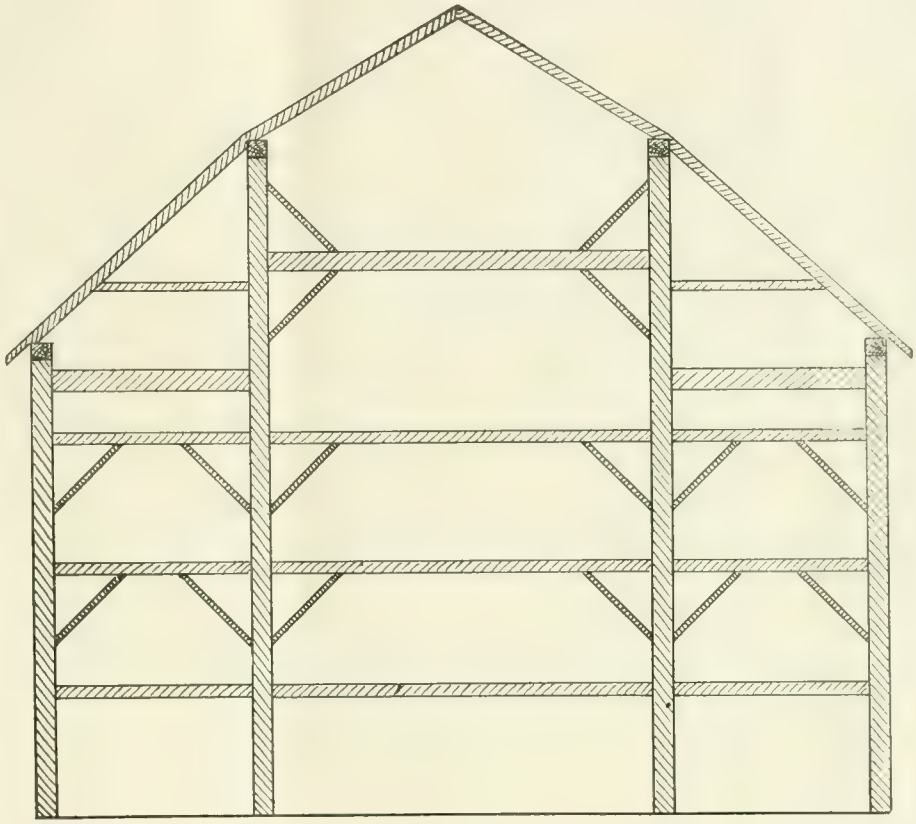
There is a vital relationship between street planning and the tax rate which should be considered in laying out new districts and erecting houses thereon for sale. The speculative builder, erecting houses for re-sale should give this matter attention if he is to make pleased buyers.

As a result of not giving this matter proper consideration, there are, in some places, streets wider or of more expensive construction than is necessary. For such lack of planning the buyer of the house must pay increased taxes.

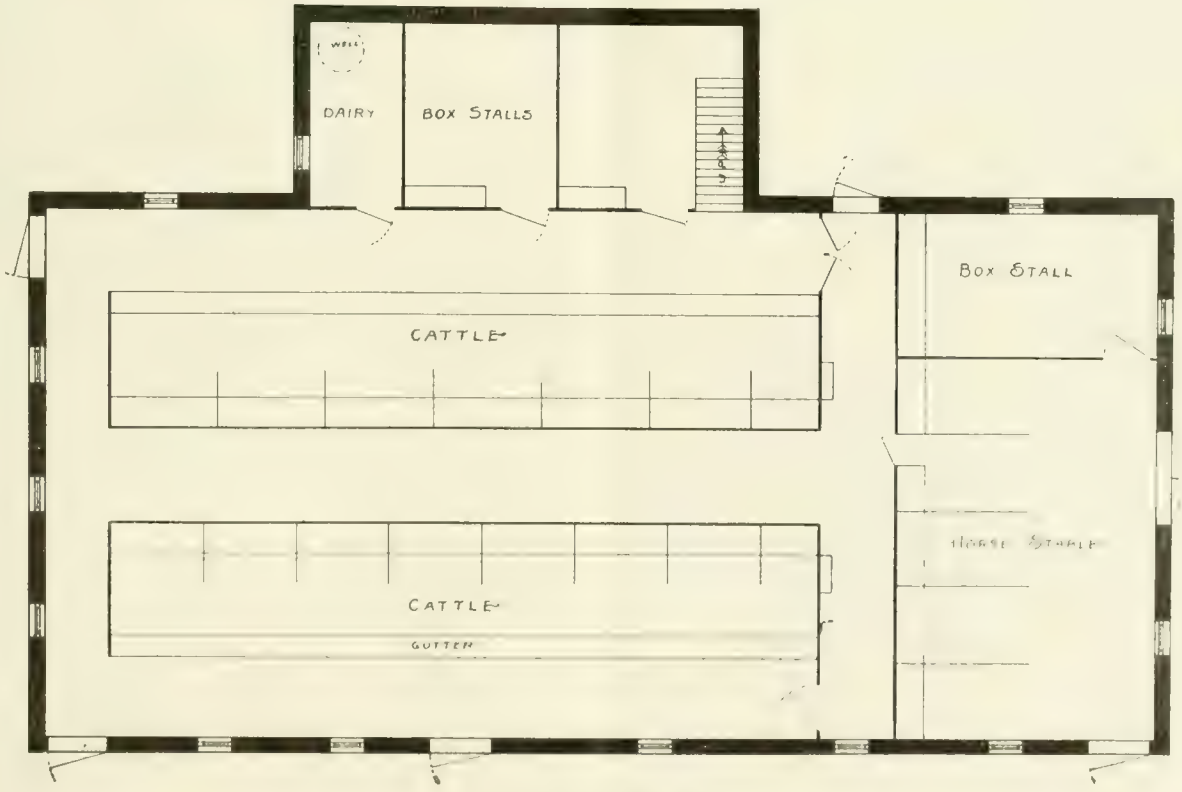
A dust-collector system without floor spouts is like a factory without a broom, in that there is unnecessary trouble and work in keeping the place clean.

If you have a swing saw with balance weights over the sawyer's head, put some extra safeguards around them as a preventive of injury in case they should accidentally drop.

IDEAL BARN PLANS



36 ft. wide, 20 ft. post



71 ft. long and 36 ft. wide

PLAN BY A. E. ROBSON, ILDERTON, ONT.

Published by Courtesy of the Metal Shingle & Siding Co., Preston, Ontario.

How to Buy Building Materials Economically

Hints on this Question of Value to the Young Builder Particularly

The greatest waste is in the purchase of common brick and lumber, although large sums are lost through careless handling or storage of perishable materials, such as Portland cement, lime and plaster. Carelessness is governed by management, hence it is not an item to be considered under the head of purchase of building materials. Losses arising from careless figuring are inexcusable because it is possible to reduce the element of waste in any building operation to a minimum, even without the aid of an expert estimator.

Suggestions for Estimating Lumber.

Allow 25 lin. ft of 2 x 4 bridging for each "square" (100 square feet of flooring). Where 2x12-in. joists are placed 16 ins. apart, it will be found that the 2x4-in. bridging amounts to 9 per cent. of the number of feet, board measure, of joists. On a plain roof count the number of rafters and add one. In estimating the number of studs for walls and partitions allow one stud for every lineal foot of wall or partition where studs are spaced 16 ins. center to center. This seemingly large allowance is made to cover the doubling of studs on corners, doors and windows. To estimate the quantity of shiplap or sheeting, calculate the exact surface to be covered, deducting openings, then add 15 per cent. for sheeting and 17 for shiplap on floors, 17 for sheeting and 20 for shiplap on sidewalks, and 20 for sheeting and 25 for shiplap on roofs.

Sheeting is laid with 2-in. space on cheap roofs. In such cases deduct accordingly. When sheeting and shiplap are laid diagonally add 5 per cent. to the foregoing figures to allow for waste in sawing both ends.

In figuring the amount of siding required, calculate the exact surface, deducting openings, and add 33 per cent. if 6 in. siding laid four and a half to weather is used. If it is 4 in. siding add 50 per cent. to the surface.

Suggestions for Figuring Flooring.

Flooring comes in two classes—dressed or square edged flooring, and dressed and matched flooring. The square edge flooring ordinarily has a face width of about ½ in. less than its nominal width, thus a piece of 6-in. square edge flooring has a face width of 5½ ins. and a piece of 4-in. flooring has a face width of 3½ ins. The loss in the case of the flooring with 5½-in. face is 9 per cent., and in the case of the 3½-in. face the loss is 14 per cent. But in addition to these mill losses there is usually waste, owing to bad ends, etc., so that after estimating the exact area of floor, 11 per cent. should be added for 6-in. flooring and 20 per cent. for 4-in. flooring. Add 17 per cent. for 6-in. flooring where dressed and matched flooring is used. 25 per cent. for the same in 4-in. flooring, 33 per cent. in 2¼-in. dressed and matched, and 40 per cent. in 1¾-in. dressed and matched flooring. Extra allowance must be made if the floor is to be laid under partitions, and if the architect has so spaced the joists that full lengths cannot be used, there may be a very large waste not included in the above allowances. This, by the way, is one of many instances where the inexperienced builder, figuring close, finds himself overwhelmed with extras. Estimate flooring less than one inch thick as one inch. Ceiling and wainscoting are estimated exactly as dressed and matched flooring is estimated.

Buying Common Brick.

In the purchase of common brick there is a great deal of waste. Bats, or half brick, result from careless dumping or loading on trucks, and the building department permits only a small percentage of these to go into a wall, generally depending upon the weight the wall has to sustain.

Common brick is sold at wholesale at so much a thousand, depending upon the season of the year, supply and demand. The term "run-of-kiln" means that the brick so sold is taken from the kiln without being selected as to hardness, color or texture. "Culled" brick is that from which all so-called pale or light hards have been eliminated and they possess a "true metallic ring" when knocked together in the hand, thus showing thorough burning and soundness. he retail or "yard" price is that fixed by the dealer and which is quoted to the consumer. It is the wholesale price, plus carting to his yard, and his profit, which varies according to the rating of the customer, the amount of credit he wishes, the distance the brick has to be hauled from yard to job, and the periods over which deliveries will extend. A thousand brick is figured at 40 cu. ft. when laid. There also are companies which deal in second-hand brick, but these seldom or never go into fair grade work except mill construction, and are not important as a marketable building material any more than is second-hand steel, trim and lumber.

Formulas for Determining Mortar Necessary.

The mortar item is an important one for the builder to consider, and in this he must guard himself against waste. A safe proportion is one barrel of cement to one of sand, makes 4.17 cu. yds. of mortar; 1 to 2, 2.84; 1 to 3, 2.06; 1 to 4, 1.62; 1 to 5, 1.33, and 1 to 6, 1.14. That is: one barrel of sand to one of cement will make 4.17 cubic yards of mortar providing the sand has 38 per cent. voids. A barrel of Portland cement weighs 380 pounds, and the weight of the barrel is figured at 20 pounds more. The size of the barrel varies, due to the difference in weight per struck bushel and to the difference in compressing the cement in the barrel. Four cloth bags make one barrel. Each empty bag weighs one and one-half pounds. If cement is bought in bags a charge of ten cents each is made, but a refund of from eight to ten cents is allowed upon a return of the bags. Cement ordered in wooden barrels costs ten cents a barrel more than in bulk.

Lime mortar may be mixed one part lime to three of sand, this proportion consuming about nine-tenths of a barrel of lime per thousand of brick, kiln count, the brick being laid with three-quarter inch joints. A common allowance in estimating the cost of mortar for standard size brick is one barrel of lime and six-tenths of a cubic yard of sand a thousand, kiln count.

About one-half a cubic yard of mortar is usually allowed per cubic yard of brick masonry, or seven-tenths of a cubic yard of mortar for a thousand of brick when the brick are laid with half inch joints. If cement mortar is used, the number of barrels of cement per cubic yard of mortar will seldom be less than 1.6 per thousand of brick, or eight-tenths barrel per cubic yard of brick masonry, for if the mortar is made leaner it will not trowel well and cause more loss in labor than is saved in cement.

Standard grades of lime are sold by the barrel, 220 lbs. net. When shipped in bulk, 2½ bushels of 80 lbs. per bushel are usually called a barrel. A barrel holds about 3.6 cubic feet. The average yield of lime paste from the best limes is 2.6 barrels of paste for each barrel of quick lime. This paste is usually mixed with two parts sand by measure. It, therefore, takes

about 1½ barrels of the best quicklime to make three-fourths as much paste as good lime.

A word may here be said about the purchase of lime in bulk. Good lime is protected against air slaking, and for that reason it is sealed and certified with the manufacturer's certificate within. This lime sells for a dollar a barrel. Many builders buy their lime in open carload lots, for about sixty cents a barrel, and think they are getting a bargain. As a matter of fact such lime is air slaked and it will take two of these sixty cent barrels to do the work of one barrel of certified lime. Here is where many builders lose money. It is a leak that would be instantly stopped if the builder would only take the time to investigate. Most individual builders do not know this difference until they find their original estimate way out of proportion to what their actual building cost proves to be.

Estimating Lathing.

Metal lath is now as generally used as wooden lath, and it is an important item of figuring construction. The standard size of wood lath is ¼ ins. x 1½ ins. x 4 ft. There is a special lath, however, which is made in 32-in. lengths. Laths are sold by the thousand in bundles of 50 or 100 laths each. The price is usually around $3 per M., and 1,500 are required to cover 100 sq. yds. Allow ten pounds of 3d fine nails for 100 sq. yds. when joists are 16 ins. c. to c., and 1,250 laths are usually counted a day's work for a lather. The total cost of wood lathing should be somewhere around $8.64 per 100 sq. yds. Metal lath runs in price from 2.65 to 2.84 lbs. a square yard, and the cost varies from 15 cents to 20 cents a square yard. The total cost per 100 sq. yds. for metal lathing should not be much over $18.50. These figures include the cost of scaffolding and is on a 6,000 sq. yd. basis.

Plastering Estimates.

Plastering is generally applied in three coats, scratch, brown and white or finish. On brick walls the scratch coat is often omitted. Plaster is made either with lime or gypsum, known also as plaster of Paris. Some plasters are made with lime gauged with Portland cement. Whatever kind of plaster is used, sand and hair are mixed with the plaster. The hair comes in paper bags, which are supposed to contain one bushel of hair when beaten up, and supposed to weigh seven pounds. Some cement plasters are sold with the proper amount of hair mixed in. Cement plaster is commonly sold in 100-lb. sacks, four sacks to the barrel.

In making lime plaster one part of lime paste is used to 2 or 2½ parts of screened sand. About 1¾ yards of sand are required per 100 yards of three-coat plaster and about 4 barrels of lime or cement plaster and 2 bushels of hair. The cost of 100 sq. yds. of three-coat plaster should come to $21.20.

Excavating, front brick, stone, stucco and other exterior material varies in cost according to the character of the work, but none of these represent such serious leakage as do the items herein enumerated.—Record and Guide.

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The Canadian Builder
and Carpenter

A Practical Paper Devoted to all Branches of the Building Trades

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Vol. 2 TORONTO, SEPTEMBER, 1912 No. 9

Plans for Workingmen's Houses

Schemes are on foot to erect workingmen's houses in Windsor, Toronto, Kingston, Amherst, N.S., and many other manufacturing centres. In order to secure plans of houses suitable for workingmen and economical in construction, the Toronto Housing Co. offered prizes as published in our July issue. In this issue we give the names of the prize winners, who are Messrs. Kendle and Martin, of London, England. It would appear that British architects, builders and contractors take a very keen interest and have considerable experienoce in the design of low-priced houses. With the present steps taken at various Canadian centres to solve the housing problem, it is hoped that Canadian architects, builders and contractors will enter into the scheme to secure the design and construction of cheap, comfortable and sanitary houses for workingmen.

We hope to print in an early issue plans and descriptions of the houses awarded the prizes by the Toronto Housing Co., and also some of the others. These will doubtless give valuable hints for incorporating in the design of houses to be erected by the efforts of various organizations in the many centres where interest has been aroused.

Prime Consideration in Town Planning

The question of town planning should be of considerable interest to the builder. He should have a confident eye on the future, a willingness to look facts in the face, to enter upon new ventures and give up minor present advantages for the future good.

At the recent Canadian National Congress of Town Planning, a letter from Frederick L. Olmsted, of Boston, was read. This letter contained a number of ideas on town planning that builders should incorporate when constructing a number of houses, or when planning a new residential district. We quote from his letter:

"As long as a town has before it any expectation of growth or change, town planning must be kept up. It is a continuous function, never finished until the town is dead.

"No limit of time can be set beyond which the future is not to be considered in town planning; yet as a practical matter, regard for the contingencies of the remote future must not be allowed unduly to delay or hamper provision for the immediate future.

"No limit of space, such as an arbitrary municipal boundary, should check the town planner from studying and providing for any physical changes required by the probable growth of any community; yet, as a practical matter, the planning for remotely outlying improvements must not be done at the expense of pressing improvements closer to the heart of the town.

* * *

"Equally important with establishing an adequate standard for main arteries of circulation and public open spaces, and providing for them while the land is yet but sparsely occupied, is the need of establishing a standard of open spaces for assuring light and air to all the buildings of a town before the unrestricted play of economic competition shall have imposed a wholly needless standard of crowding and darkness. No matter how far a town may see fit to go or how short it may see fit to stop, as concerns planning and regulating the developing of private property in other respects; no matter whether it leaves the layout of local streets wholly to the initiative of landowners, or fixes every one of them according to a set plan; no matter what its building law may be; it owes to its citizens and to the whole body of its landowners the definite establishment of standards beyond which its landowners may not be driven by economic competition in crowding the land with buildings.

"Ten thousand dwellings of a given cubic capacity and of a given quality of construction cost about the same to build when they are so spaced that every room is light and airy as when they are crowded together in a dark and pestilential slum. A town of a given population, other things being equal, has about the same total land valuation where it is spread sufficiently to give all its people decent living conditions as when large portions of them must live and work in dark and ill ventilated rooms.

"Where unsanitary and uncomfortable crowding of the building masses is avoided the extra cost involved is mainly in a somewhat greater length of local streets with their underground service mains. That extra cost is so small a fraction of the total cost of buildings and lots as to be almost negligible, and it is not, of course, a desire to avoid this slight extra cost of street construction and maintenance which causes injurious crowding of building masses, but merely the pressure of commercial necessity where land values are fixed in relation to the rental derivable from the most crowded condition which is possible under the law, without driving away tenants.

* * *

"It is, therefore, one of the prime duties to be faced in Town Planning to define and firmly establish standards in respect to the obstruction of light and air by building masses.

"Town Planning is much more than the things I have been speaking of; there is, indeed, nothing in the town that lies beyond its pure view and it is, or should be, at all points, dominated by a keen appreciation of the aesthetic values that can be realized in solving the problems of town development, but I think it is fair to say that its paramount duty, at the present day, is to deal with the problems of assuring the future town, at all stages of its growth, of adequate main arteries of circulation, adequate public open spaces for recreation, and adequate spaces for the admission of light and air to every room in which its future citizens shall work and live."

Brick Work, Concrete Work and Masonry

Getting Brick Results

If you have a wall of brickwork and the bricks are very soft, broom down clean and apply a size of acid water, just enough muriatic to sour the water. Let this be rinsed off with clear water, let it dry, then apply all the raw oil the wall will take. This is for a first-class job, and the oil will prevent the chipping of the brick afterwards. The oil makes the bricks harder, and also waterproof. Hard bricks will not need so much oil. Where the wall has been filled with raw oil, the first coat of paint should be of good quality, and according to what the finish is to be; if to be painted like wood, it should be thinned with oil and turpentine until the last coat, which should be done with all oil. But if a dead brick finish, then use all turpentine color for the finish, though the priming may be all oil, and the next coat or two, half and half, as the dead effect is surer on a partly lustrous ground or on a perfectly full luster.

The back-plastering should be a heavy coat well troweled so that the lath is entirely enveloped. The finish coat may be done in a way to get any one of the many surfaces which give stucco its charm; this coat should contain no lime as it makes the wall more porous and if a lighter color is wanted than can be gotten with ordinary cement, a white Portland cement should be used.

The waterproofing acceptable to the architect should be mixed with the last coat of the exterior according to directions given by the manufacturer.

The exterior plaster must not be allowed to set rapidly, if necessary, hang a curtain in front of the wall of burlap or other material that can be kept moist for a couple of days. Stucco should never be applied when the temperature is below freezing.—Ohio Architect, Engineer and Builder.

Slate Roofs for Concrete Buildings

In a discussion of the service and value of slate for covering the roofs of concrete buildings, some pertinent suggestions are offered by R. J. Kichline, who is identified with slating interests at Slatington, Pa. He states that the reason slate is the ideal material with which to cover the roof of a concrete building is because it is practically indestructible, will not rust, rot or burn, is not affected by climatic changes, acids, gases or other substances, and furthermore will neither expand nor contract under influences of heat or cold.

Roofing slate of uniform shade, he points out, contributes to the beauty of the building, as no deposit can obscure its original color, for with each passing shower any particles of dust or dirt are washed from its plain, smooth surface. A slate roof when once in position needs few if any repairs and requires no painting or other preservative care. It is absolutely clean and the water from its surface is instantly available for household use.

The superiority of a roof material he states is determined by its first cost, durability, resistance to fire, cost of maintenance, repairs and insurance.

Slate is sold by the square; that is, enough slate to cover a space of 10 feet square or 100 square feet. The part of the slate exposed to the weather is the part sold or figured to make up the number of pieces of the various sizes to make a square. A square of slate is almost as cheap as 100 square feet of tin in original cost, and costs but little more than a thousand shingles.

It is claimed with confidence that a roof made of good slate will last 75 years without appreciable deterioration either in appearance or serviceable quality. Consequently a good cement building covered with a good slate roof should last several generations.

The original cost and durability should be considered together, for the cost of a roof having a life of only five years should not be more than half as much as the cost of one having a life of 10 years, and if a shingle roof will last 10 years and a slate roof 50 years, then slate would be as cheap as shingles though the cost were five times as great.

Upon this fair principle, taking the life of the best slate at 75 years—although there are some slate roofs in America in use more than 100 years—we find the cost of a slate roof in the vicinity of Chicago is about 12 cents per square per year.

Therefore a concrete building roofed with a good grade of slate will last more than a lifetime, is fireproof, is sanitary, is beautiful, is the cheapest in cost, maintenance and insurance.

A slate roof, therefore, in his opinion, is the cheapest to put on any building, and especially on concrete buildings.

Cause of Many Mixer Troubles

"To a large extent, mixer troubles are journal troubles," said a well-known mixer manufacturer, in a recent discussion. Excessive wear of shifting of journals makes the gears mesh improperly, and in time causes traction rings to corrugate or cup. This last is one of the most serious of mixer troubles, and it is invariably due to play in the journal boxes. This same corrugation is observed in the rails of trolley lines, etc., and has been traced to play in the journals. "Look after your journals," said this manufacturer, "and your mixer will never cause serious trouble."—American Carpenter and Builder.

Eliminating Dust From Concrete

A Massachusetts builder gives two methods which have proved satisfactory for stopping the dusting of floors already built.

The first is to apply a coating of boiled linseed oil and, second, a coating of water glass or sodium silicate. As a rule there is entirely too much working on the surface material in laying concrete floors. As natural stone is much harder than concrete it will resist abrasion much better and therefore the larger percentage of natural stone which can be brought to the surface in laying concrete floors the less will be the dusting. The more the troweling the more will the smaller particles be worked toward the surface. Furthermore, the last of successive trowelings which are common is apt to take place after the concrete has

taken its initial set and therefore tends to reduce the strength.

He also states that if the finished floor is laid integral with the underflooring, all being placed in one operation the top layer can be considerably thinner than if applied after underflooring has set.

Painting Cement Buildings in Germany

The publication in Daily Consular and Trade Reports for January 3, 1912, of an article on building methods in Hamburg, prompts enquiry in regard to the class of paint used on cement structures in Germany. It is claimed that large amounts of money are expended in the United States in painting cement and concrete with unsatisfactory results, the paint either peeling or discoloring rapidly.

According to information obtained from builders and architects, the principal precaution taken in Northern Germany to prevent the peeling of oil paints is to defer their application until the cement is quite dry. When it is intended to apply color on outside walls which are still damp, water paints are used which are weather-proof and which can be washed if necessary. These colors, necessarily, are not impervious to moisture.

In his textbook for 1910 Dr. Glinzer, director of the State Building School in Hamburg, says that to make oil paints adhere to cement, the surface of the material should be coated with diluted sulphuric acid (1 part concentrated acid to 100 parts of water), which afterwords must be washed off and the surface allowed to dry. Or the surface may be covered with diluted silicate of soda (wasserglas), the solution to be 1 to 3 or 1 to 4, and applied three times in succession. Still another method is to apply two coats of building "fluat" at least 24 hours apart. Practical builders state, however, that the applications of sulphuric acid are not made by them, and that such success as they have results merely from careful work and the use of good materials.

Dr. Glinzer says that oil paint should be applied to cement in the following manner: The surface is given one coating of linseed-oil varnish, to which is added a first coat of white lead when the varnish is dry. A second coat is then added, also containing white lead, together with more or less coloring matter, as the building laws forbid the use of absolutely white paint on the exterior of structures. In this climate the use of oil paints is recommended, as they are waterproof, and present smooth surfaces, which attract a minimum of dirt. Painting according to this method costs here about 10 cents per square yard.

Applied to iron, linseed-oil varnish when used by itself flakes off readily. It should be thoroughly mixed with red oxide of lead, capot mortuum or other graphite. This mixture serves as a first coat after the perfectly clean and dry surface has been gone over with ordinary hot linseed-oil varnish. When the dead color has dried another coat of the color desired is applied. The oil being partly converted into resin, combines with the coloring material, making a thick coating that is the more impervious to water accordingly as the color is finely ground or not. Lead should be used when the paint is exposed to water.

The water colors so frequently used in Germany as a rule have silicate of soda as their base. These colors can be used on cement, plaster of Paris, brick or glass. Liquid casein paints are easily worked and are said to be durable. The discoloration of cement buildings results very frequently from the class of cement employed rather than from the color applied afterwards. —Paint and Varnish Record.

Building Trade News

The building permits in Brandon for 1912 up to the end of August amounted to $729,447.

Building permits issued in St. Catharines during the month of August totalled $109,320. For the first eight months this year building permits have exceeded the half million mark, the total figures being $502,810 for 2,884 permits, as against $132,385 for 87 permits during the corresponding period of 1911.

Mr. W. Frank Evans has been appointed manager of the new Concrete Reinforcement Department of Alfred Rogers, Limited. Mr. Evans was formerly chief engineer of the Expanded Metal and Fireproofing Co. He will attend to the sales of "Steelcrete" concrete reinforcement, for which Mr. Rogers has obtained the agency from the Consolidated Expanded Metal Co. of Pittsburg.

The building permits for Edmonton in August amounted to $1,217,217. The 343 building permits issued during August covered: 239 residences, $552,475; 1 railway depot, $200,000; 1 wholesale warehouse, $80,000; 10 stores and offices, $70,700; 2 temporary bank buildings, $7,200; 2 theatres, $54,000; 1 church, $12,000; 1 temporary school, $3,000; 1 mounted police barracks, $45,000; 1 street car barn, $50,000; 1 street car shop, $19,000; 83 sheds, workshops, stables, etc. The permits for the first eight months of 1912 were $10,250,467.

Building permits for Toronto were $3,822,975 for August, 1912, as compared with $1,877,372 in August, 1911. There were 876 permits in August. For the first eight months of 1912 the permits amounted to $19,317,820 compared with $16,603,845 in the first eight months of 1911. The number of permits, however, is 4,762 against 5,116 for the similar eight months in 1911.

Lockwood, Greene & Co., 93 Federal St., Boston, are preparing plans and specifications for a two-storey reinforced concrete garage 100 feet x 60 feet for J. A. Pugsley & Co., 65 Canterbury St., St. Johns, N.B. The building will be designed for two future stories and Lockwood, Greene & Co. are planning the heating, lighting, and fire protection equipment.

The total building permits issued at Winnipeg in 1912 up till the middle of August is $16,384,100, a sum which is just $1,166,000 short of the total building for last year, and $1,268,000 in excess of the total expended for this purpose in 1910.

Sand

Large numbers of people have brilliant qualities; they know a great deal, are well educated, but they lack sand staying power. They can't stand by a proposition and see it through thick and thin to the end. They lack that bulldog grit which hangs on until they triumph or die. They lack the clinging ability that never lets go, no matter what comes. They work well when things go smoothly; they are fair weather sailors, but are terrified in a storm, paralyzed in an emergency. Staying power is the final test of ability.

—The Macey Monthly.

Carpentry and Woodworking

Laying a Dance Hall Floor

To lay a perfect floor and finish it quickly was the task demanded of Mr. J. M. Philpott of Loyal, Wisconsin. The new Opera House was in the course of construction and the association decided to hold a dance for which it was necessary to lay the floor in a hurry.

Mr. Philpott used a Fox Floor Scraper and he kept two men busy laying the floor while he used the scraper. The pile of shavings shown in the photograph illustrates that he did some scraping, and the smooth appearance of the floor where he has gone over it is proof of the high class work this machine will do.

The auditorium floor is 40 x 68 and the stage floor 22 x 40. It is one of the best floors in that part of the State, and Mr. Philpott has received many compliments on the high quality of his work.

Laying and Finishing Oak Floors

Details of Laying and Nailing—Scraping and Various Forms of Finishing

By W. L. Claffey

The laying of oak flooring is not very difficult and any first-class carpenter can make a good job. A sub-floor should be used under both the 13/16-in. and ⅜-in. thicknesses. The sub-floor should be reasonably dry and laid diagonally. Boards of about 6 in. wide are preferred. These boards should not be put down too tight and should be thoroughly dried and cleaned before oak flooring is laid.

It is well to use a damp proof paper between the oak flooring and the sub-floor. Where sound-proof results are desired, a heavy deadening felt is recommended.

Oak flooring should be laid at an angle to the sub-floor. After laying and nailing three or four pieces, use a short piece of hardwood 2 x 4 in. placed against the tongue, and drive it up with a sledge.

The nailing of oak flooring is very important. All tongued and grooved oak flooring should be blind nailed. The best floor made can be spoiled by the use of improper nails. The steel-cut variety is recommended for all blind nailing.

For 13/16-in. use 8-penny steel cut flooring nails. For ⅜-in. use 3-penny wire finishing nails.

The maximum distance betwen the nails should be:

For 13/16-in. thicknesses..... 16 in.
For ⅜-in. thicknesses..... 10 in.

For even better results, it is recommended the nails be driven closer than indicated.

Scraping Oak Floors.

After the oak floor is laid and thoroughly swept, it is best to scrape it in order to get the best results for a nicely polished surface. This scraping process can be done by the ordinary scrapers, such as used by cabinet makers, or by one of the many types of power or hand-scraping machines that are generally used by contractors and carpenters. Always scrape lengthwise of the wood, and not across the grain. A floor properly scraped looks very smooth, but still it should be thoroughly gone over with No. 1½ sandpaper to obtain the best results in finishing. After this the floor should be swept clean and the dust removed with a soft cloth. The floor is now ready for the finish.

Finishing Oak Floors.

The finishing of an oak floor is a very important feature, upon which authorities fail to agree, but the

Laying a dance hall floor, using a Fox floor scraper for finishing. Scraper manufactured by the Fox Supply Co. Brooklyn Wis.

question resolves itself into a matter of cost, as to the color or brilliancy of finish desired. Personal taste, artistic or decorative effects are the guide for the floor finisher.

The clear grade of oak flooring should have a natural oak filler—color of oak; the select and sap clear grades, a light golden oak filler should be used, and after the floor is filled it should be gone over with a little burnt umber mixed with turpentine to darken light streaks. This will make the select and sap clear grades look like the clear grade, except that it will be slightly darker in color. In filling the No. 1 common grade a dark golden oak filler should be employed, and the light streaks should be darkened in the same manner as the select and sap clear grades. If a little care is used in laying this grade splendid results can be obtained.

Treat the floor with a paste filler of desired tone, to fill up the pores and crevices. To thin the filler for application, one has a choice of using turpentine, benzine, wood alcohol or gasoline to get the right consistency. When the gloss has left the filler, rub off with excelsior or cloth, rubbing against the grain of the wood. This will make a perfectly smooth and level surface. It keeps out dirt and forms a good foundation, which is the keynote for successful treatment of floors. Allow the filler 12 hours to set or dry before applying a wax or varnish finish. Never use a liquid filler on any floor.

A wax or varnish finish can be used. The wax finish is preferred by many, due to economy, and ease of renewing places that show the wear. This renewing can be easily applied by housekeeper or servant.

Wax Finish

The best method for applying the wax is to take cheesecloth and double it to get a little more thickness; then make it into a sort of bag. Put a handful of wax inside of this and go over the floor thoroughly. You will find that you can work the wax through the meshes of the cheesecloth to give an even coating over the floor. This prevents too much wax in spots and wasting it. After the floor has been gone over with the wax and allowed to dry, say about 20 minutes, it is ready for polishing. Rub to a polish with a weighted floor brush, first across the grain of the wood, then with it. (A clean, soft cloth can be used in place of the brush if desired); then a piece of woolen felt or carpet should be placed under the brush to give the finishing gloss. After waiting an hour, a second coat of wax should be applied in the same way as the first and rubbed to a polish.

Varnish Finish

This is usually more expensive than the wax finish, but it gives a very hard surface, yet at the same time it is elastic. Two or three coats should be applied after the application of the paste filler. Each coat should be thoroughly rubbed with oil and pumice. Any of the standard hardwood flooring varnishes are recommended.

Floor Oil Finish.

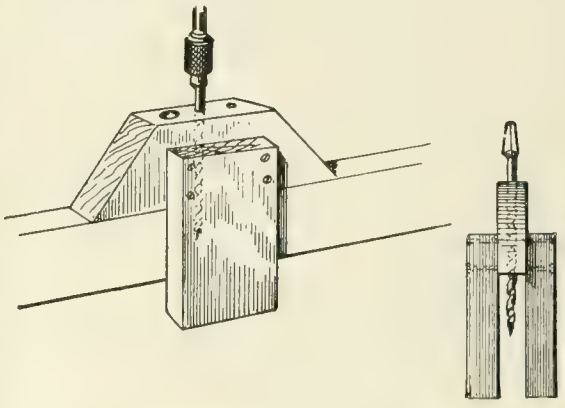
When a high-class finish is not desired, a very economical finish can be had by the use of a light flooring oil that is made expressly for this purpose by many paint and varnish houses and oil makers; it serves as a filler as well as a finish and is strongly recommended for oak flooring in public institutions, office buildings and stores. This oil keeps the dust from rising and preserves the floor.

Gauge for Boring Dowel-Pin Holes

By William Grotzinger

It is often a difficult matter to bore straight dowel-pin holes in two pieces of wood, which are to fit together squarely and tightly. The following description of a gauge for the purpose should be readily understood:

It is made from a piece of oak board, with two side pieces screwed so as to form a socket in which the



Gauge for Boring Dowel-Pin Holes

work fits and is held squarely. A number of different size holes are bored into the oak piece, so that bits of different sizes can be used, for large or small dowel-pins. Mark the work with a pencil where the holes are to be bored, put the gauge over the work, and put the bit in the holes of the desired size. Be sure to get the bit on the pencil mark, then bore the hole. If the gauge happens to fit a little loosely, it can easily be made tight by wedging it with small wooden wedges.—S.A.

Enlarging a Bore With an Auger

By F. H. Jackson

The following kink should prove useful for plumbers or gas-fitters: When boring a hole through a joist for a pipe, the auger ran into a knot, throwing it a little out of line, so that the pipe when run through the hole

Enlarging a Bore with an Auger.

would not screw into the fitting. The trouble was overcome by fitting a small circular piece of wood of same diameter as hole, on the spur of a larger auger which made a guide, and the hole was easily enlarged to a suitable size.—Scientific American.

Correspondence and Discussions

Readers are invited to send replies to questions asked by readers of The Canadian Builder and these will be paid for at regular editorial rates. Anyone desiring the names of firms manufacturing certain lines will be answered in this department.

Comments on articles published in The Canadian Builder are welcomed and all letters containing good ideas will be paid for.—Editor.

* * *

Which of the Two Intersecting Points, is Right.

Will a reader of The Canadian Builder please answer this question. The accompanying drawing shows a verandah floor. The one on the right shows 8 feet each way. In this case the intersecting points would be from corner to corner of the brick pier.

We changed the size of the verandah on one side of the house to 7 feet wide as shown on the left hand of the sketch.

A dispute arose as to which of the two intersecting points was right. I would appreciate having Canadian Builder readers reply.

TORONTO SUBSCRIBER.

* * *

The Canadian Builder Pleases Him.

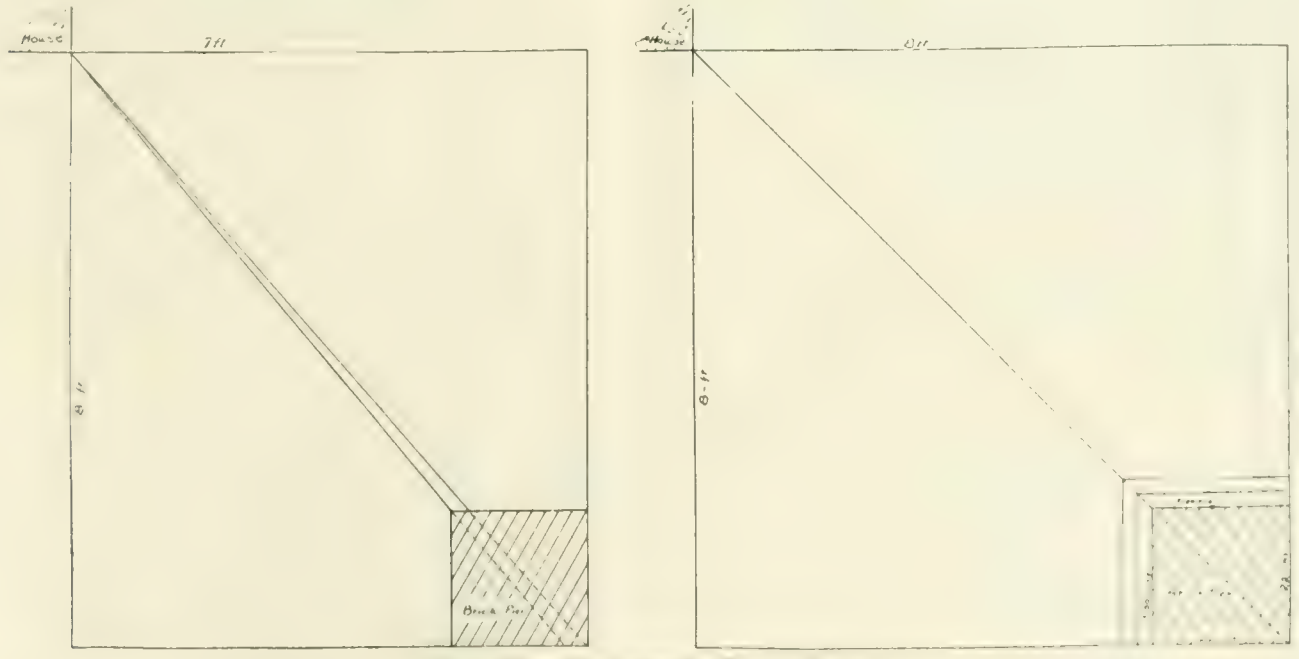
In reply to your letter of the 24th, I confess I should not have written in "lighter vein" had I thought that the fact of my subscription was not clearly established. I have since made unsuccessful search for my receipt. Fact is I can't find anything as my wife has just returned from the Old Country and has been putting things in order. I presume the matter is clear to you now, as I have to-day received the August edition. But if not, I can assist in tracing it, for I can find the receipt number immediately preceding my own, as I paid for the two on the job at Dundas Street, store and flats by Mr. Webb. I hope it is clear now anyhow, and thanks for the June and July editions which came safely yesterday.

May I dare to comply with that most fortunate postscript querie you have under the Building Material price list? I have often thought it would be an advantage if prices for scantling and tongued and grooved material were given for actual measurement or finished surface as the case may be. If such pricing could be given collaterally with your present square measure I think it would be appreciated by many. Also I think that in at least certain cases it would be a benefit to plan scales to the regular size of glass. If the supposition is correct and economy could thus be effected, a list of such regular sizes would be beneficial to your subscribers.

By the by, is it impossible to obtain "Compo Board" in Ontario? Compo Board being, I believe, the name of various sized slabs of veneer and composition used in place of plaster and lath for interior wall finish. I should like your views on the subject if you have not already dealt with the matter. I was going to ask about partition slabs, but 'twere better that do not presume too far.

'Tis almost superfluous to say that I am entirely pleased with The Canadian Builder, believing that it stands to comply admirably with the needs of those in any way connected with the building trade.

GILBERT A. CLOTHIER.



Which of these Two Intersecting Points is Correct?

A Portable Machine Shop for Builders

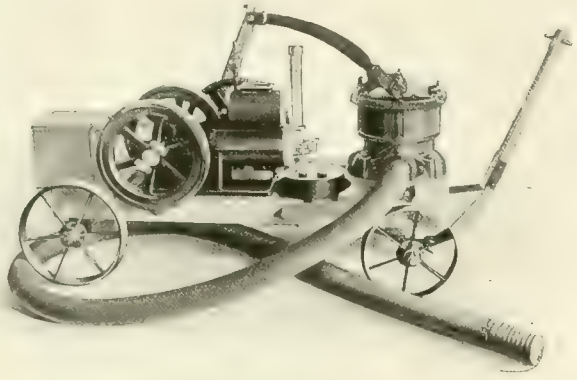
Those engaged in the building trades who have tools to grind will be interested in the New Hummer made by the Luther Grinder Manufacturing Co., Milwaukee, and distributed in Canada by their agents, Henderson and Richardson, Board of Trade Building, Montreal.

The assembled machine is shown in Fig. 1. It is without the chain drive feature and the transmission is made up of two sets of bevel gears and a vertical shaft giving a direct drive which eliminates the danger of getting out of alignment or adjustment. The machine is constructed entirely of tubular steel and angle iron combining to make a strong and rigid frame with minimum weight.

The head of the grinder (which swivels so that either the face or edge of the wheel may be used),

has four spindles, three horizontal and one upright. The third horizontal spindle can be used for any grinding wheel or for attaching a drill chuck. Endless uses can be found for this third spindle, such as polishing, buffing, etc.

Over thirty attachments can be used with this machine and Fig. 2 shows a few of these numbered as follows: (1) medium dimo-grit wheel; (2) coarse dimo-grit wheel; (3) universal tool rest; (4) chisel and plane bit guide; (5) razor hone; (6) scythe stone; (7) saw gummer; (8) felt polishing wheel; (9) fine dimo-grit wheel; (10) cloth buffing wheel; (11) oil stone; (12) pocket hone; (13M) plane bit honing attachment for putting a perfect bevel on chisels and plane bits; (14M) twist drill sharpening attachment for giving the proper clearances and angles to twist drills.



Power pump to save money.

The makers have published a book which shows other attachments for this machine and also other similar machines which they manufacture. The portable feature of the Hummer should recommend it to those in the building trades, while the numerous uses to which it can be put make it a convenience well worth having.

Henderson and Richardson will be glad to send a catalogue to any reader of this paper who will send them their name and address, mentioning The Canadian Builder.

Power Pump to Save Money

The Pump illustrated here will pump out water from foundations or any other place where a builder may be troubled with water, at an average rate of 2,000 gallons per hour. With a hand pump it would cost about $5 per day in labor to do the same amount of work, whereas the cost of operating this pump will not exceed 35 cents per day.

Contractors with much pumping to do could soon save the cost of this pump, and at the same time get better satisfaction.

The pump is made by Wettlaufer Brothers, 178 Spadina Ave., Toronto.

Canadian National Association of Builders' Exchanges

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Toronto	P. L. Fraser, Sec., 2 Berti Street
Quebec	A. Cote, Sec., 23 Rue St. Jean.
Ottawa	W. Hastings, Sec., 22 Metcalf Street.
London	Geo. S. Gould, Sec., Bank of Nova Scotia Building.
St. Thomas	E. O. Penwarden, Sec., Dowler Block.
Kingston	E. R. Beckwith, C.E., 292 Earl Street.
Sault Ste. Marie	MacPhail & Wright Cons. Co., Ltd., P.O. Box 835.
Brantford	A. J. Cromar, Sec., 103½ Dalhousie St., P.O. Box 212.
Windsor	Geo. A. Freeman, 44 Campbell Avenue.
Hamilton	A. Heatley, Sec., 7 East Avenue South.
Stratford	J. L. Young, Contractor.
St. John, N.B.	Chas. F. Stevens, Builders' Exchange.
Halifax, N.S.	H. Roper, care S. M. Brookfield, Ltd., 58 Granville Street.
Winnipeg, Man.	A. M. Rose, Sec., Portage Avenue and Hargrave Street.
Regina, Sask.	Geo. Powell, Sec., Builders' Exchange.
Calgary, Alta.	W. W. Hay, Secretary, Board of Trade Building.
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Medicine Hat, Alta.	J. D. Everard, Sec., Builders' Exchange.
Lethbridge, Alta.	E. Power, Sec., Acadia Block.
Vancouver, B.C.	Builders' Exchange, 342 Pender Street.
Victoria, B.C.	Chancery Chambers.

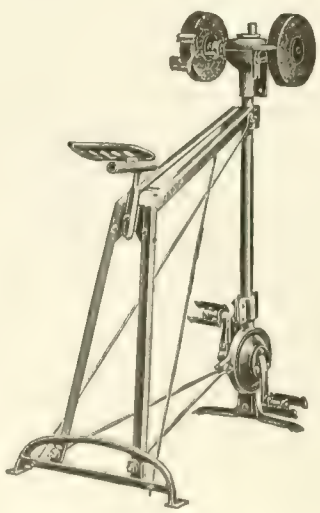


Fig. 1. New Hummer Grinding Machine, sold in Canada by Henderson & Richardson, Montreal.

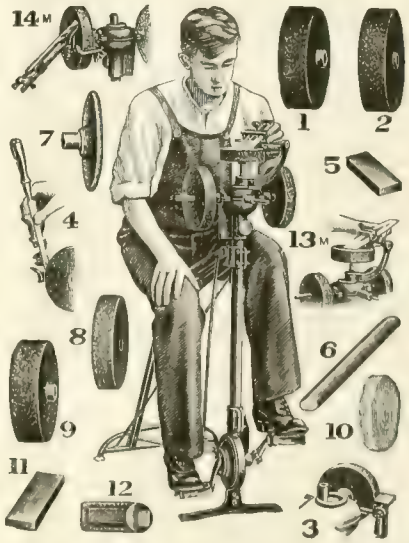


Fig. 2. Some of the attachments which can be used with the New Hummer.

Barrett Specification Roofs

On Four Great Granaries

To cover the four huge granaries illustrated herewith the Canadian Pacific R. R. engineers, chose Barrett Specification Roofs for good and sufficient reasons.

These practical men know that these roofs will last *20 years or more.*

They further know that they will need no painting or maintenance expense of any kind and that the net cost per year of service will be infinitely lower than could be shown by any other type of roofing.

It is for these very reasons that Barrett Specification Roofs are used on more first-class buildings in the United States and Canada than any other kind.

A big roof generally means a Barrett Specification Roof, for the reason that the cost of big roofs is carefully scrutinized and ultimate economy carefully considered. Small roof areas ought also to have Barrett Specification Roofs, because they are just as economical and satisfactory there.

Copy of The Barrett Specification with tracings ready for incorporation into building plans free on request. Address nearest office.

THE PATERSON MFG. CO., LIMITED

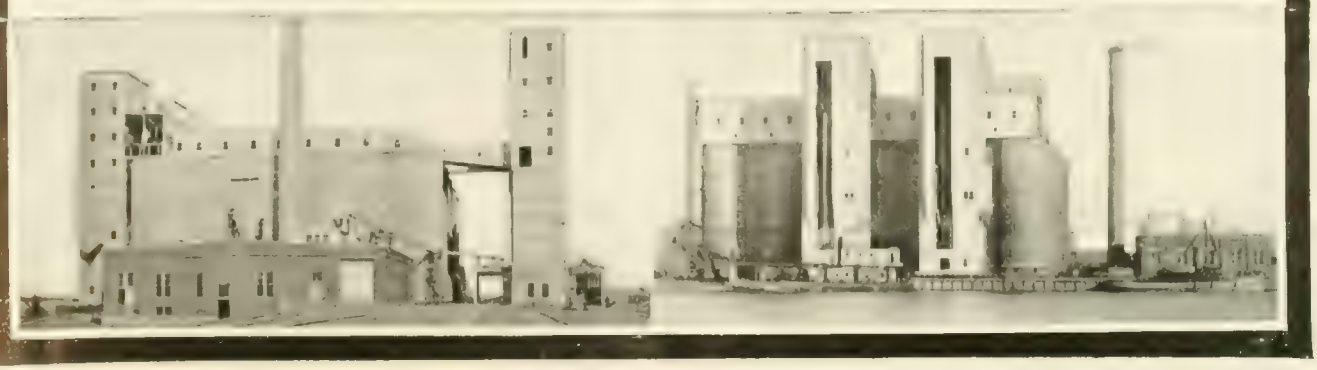
MONTREAL TORONTO WINNIPEG VANCOUVER

Special Note

We advise incorporating into plans the full wording of The Barrett Specification, in order to avoid any misunderstanding.

If any abbreviated form is desired however the following is suggested :

ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15, 1911, using the materials specified, and subject to the inspection requirements.



Price List of Building Materials—Revised to Date

	PRICE AT MONTREAL	PRICE AT TORONTO	PRICE AT WINNIPEG	PRICE AT VANCOUVER
Hemlock Lumber				
2 x 4 in. to 2 x 12 in., 8 to 14 ft.	$20.00	$22.00		
2 x 4 in. to 2 x 12 in., 16 ft.	22.00	23.00		
2 x 4 in. to 2 x 12 in., 18 ft.		26.00		
1 in. Hemlock No. 1	20.00	20.00 to 23.00		
No. 1 hemlock decking	23.00	23.00		
No. 2 hemlock dimension and 1 in.		16.00 to 18.00		
Pine				
1 in. common pine, 8 to 12 in. wide, rough	$27.00 to 30.00	$27.00 to 30.00		
2 in. white pine, bill stock	29.00 to 33.00	29.00 to 33.00		
⅞ x 8 and 10 in. pine shelving	36.00 to 40.00	36.00 to 40.00		
⅞ x 12 pine shelving	42.00	45.00		
No. 1 white pine flooring	40.00	32.00		
No. 1 spruce flooring	30.00	26.00		
No. 1 pine decking, D2S	40.00	30.00		
Spruce pine decking		25.00		
No. 1 pine V. or beaded sheeting	37.00	35.00		
No. 2 pine V. or beaded sheeting	31.00	31.00		
Pine Trim for Paint Finish				
4 in. casing, per 100 ft.	$2.00	$2.00		
5 in. casing, per 100 ft.	2.00	2.25		
8 in. pine base, per 100 ft.	3.50	3.25		
10 in. pine base, per 100 ft.	4.25	4.25		
4 in. pine window stool, per 100 ft.	2.75	2.75		
Shingles, Lath Roofing, Etc.				
XXX B. C. cedar shingles		$3.60 per M	$4.00 & 3.50 per M	$2.10 & 2.00 per M
N. B. Extras		3.50		
N. B. Clears		2.90		
No. 1 pine lath	5.00	4.75 per M	5.75 per M	2.75 per M
No. 2 pine lath	4.50	4.25		
No. 1 spruce lath	4.00	4.00		
Metal lath			.15 to .19	
Roofing Felt (2 ply)			2.50 per roll	
Cedar Posts—Fence				
5 in. at small end	5c. foot	.25 each		
7 in. at small end	7c. foot	.35 each		
Hardware				
Nails, wire, common	$2.35 base keg	$2.30 cwt.	$3.70 per keg	$3.25 per keg
Nails, cut, common	2.55 " "	2.75	3.70	4.25
Sash weights, cast iron	1.50 per 100 lbs.	1.65		
Tarred felt paper	.40 roll	1.65	.90 per roll	.62½ per roll
Building paper	.30 roll		.75	.70
Insulating paper			1.25	
Brick, Tile, Terra Cotta, Sewer Pipe				
No. 1 dry pressed red brick	19.50	$18.00 per M	$25.00 to 50.00	$45.00 per M
No. 1 dry pressed buff bricks	20.50	18.00	25.00 to 50.00	45.00
Red stock bricks	11.00	12.00	13.00	13.50
Grey stock bricks		11.00		
Wire cut bricks for foundation work		11.00		
Porous terra cotta bricks		15.00	$15.00 per M	
No. 1 enamelled bricks, all colors, from		80.00 to 150.00	100.00	
Fire brick	25.00		45.00	45.00
Roofing tile			.15 per ft.	
Sewer pipe, 4-inch	10c. foot		.08½ per ft.	.15 per ft.
Sewer pipe, 6 inch	15c. foot		.16½ per ft.	
Cement, Plaster, Stone, Etc.				
Cement (bags extra)	1.80 bbl.	$1.90 bag	$2.50 per bbl.	$3.25 per bbl.
Sand, for cement or brick work	1.00 ton	1.15 a yard	1.75 a yard	
Lime	12.00	.38 cwt.	.32 per bu.	1.35 per bbl.
Hydrated lime	13.00		12.00 per ton	4.25 per bbl.
Mortar color	5.00 bbl.		.05 per lb.	
Plaster of paris	2.35	3.10 bbl.	4.00 per bbl.	4.25 per bbl.
Crushed stone, 2 in.	1.50 ton	1.30	2.75 per yard	
Crushed stone, 1 in.	1.60	1.35	2.75	
Crushed stone, ⅜ in.	1.75	1.45	2.75	
Hardwall plaster	$12.50 neat 6.00 sanded ton		12.50 per ton	15.00 per ton
Gravel	1.85 ton		1.85 per yard	
Hair (plaster)	.03 per lb.		1.25 per bale	15.00 per ton

NOTE TO READERS. We would be glad to have suggestions from readers as to the extension or modification of this list.

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Readers, Attention!

If you have put up what you consider an attractive, well-designed house or bungalow of moderate cost, send plans, photos and bills of material to us for publication in The Canadian Builder.

The advertising you will get from the appearance of your house in the paper will make it well worth your while.

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Metal Shingle & Siding Co., Preston, Ont.

Ceilings and Walls, Embossed Steel.
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Ideal Concrete Machinery Co., London, Ont.
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Wettlaufer Bros., Toronto.

Concrete Sill, Lintel and Dimension Stone Machines.
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Ideal Concrete Machinery Co., London, Ont.
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Wettlaufer Bros., Toronto.

Concrete Reinforcements.
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Consumers' Gas Co., Toronto.

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Herringbone Lath.
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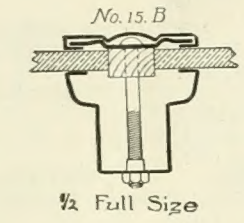

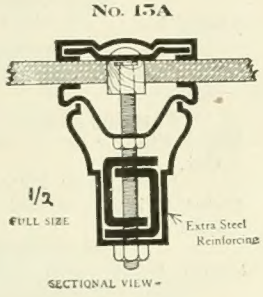

This is our Ordinary No. 15 B Dividing Bar.

Our No. 15 A reinforced Dividing Bar—note the steel reinforcement. No broken plates where this bar is used.

Our No. 15 A Bar will carry the largest plates without danger of breakage from vibration or wind pressure.

The Consolidated Plate Glass Co.
of Canada, (Limited)
Winnipeg TORONTO Montreal

Modern Methods Pay

From builders and contractors all over the country we hear the same story. "Your

PARISTONE Hardwall Plaster

is as cheap as lime mortar, and superior to any other hardwall plaster we have ever used."

Simply add sand and water and apply. It dries hard as a rock and will save weeks of your valuable time.

Ask

The Alabastine Co.
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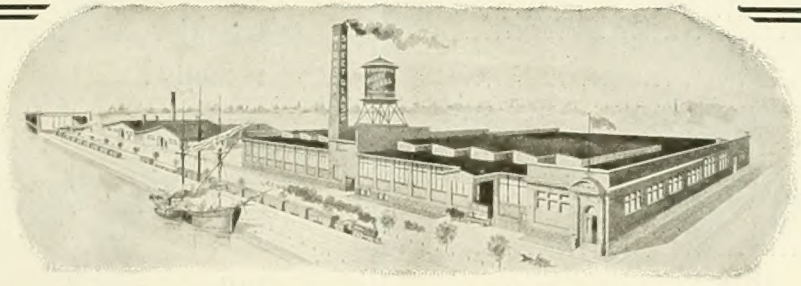

GLASS
BENDERS
TO
THE
TRADE

THE TORONTO PLATE GLASS IMPORTING COMPANY, LIMITED
Plate, Window, Figured, Stained, Wired, Bent, Mirror and Ornamental Glass
DON ROADWAY TORONTO

British Made
TERRA COTTA
the product of
King Brothers, Limited
Stourbridge, England
Proprietors of Stourbridge Clays
Reds, Buff, Stone, Grey and all colors, glazed and unglazed
Estimates on application by
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Tel. M. 3877 Don Roadway, Toronto Limited

Standard Ideal Ware

To those contemplating building whether it be a home, an office building or other premises where sanitary appointments are necessary, the question of perfect sanitation is considered the most serious one. In Standard *Ideal* Ware you have the only absolutely sanitary ware made anywhere in the world—and that beyond cavil or dispute.

Write for Handsome Booklet, "Artistic Sanitation in the Home"

The Standard Ideal Company Limited

Head Office and Works: Port Hope, Ontario
Branches:—Toronto Montreal Winnipeg Vancouver

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Ideal Concrete Machinery Co., London, Ont.

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Duncan Electrical Co., Montreal.

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Standard Ideal Co., Port Hope, Ont.

Soil Pipe Fittings.
Standard Ideal Co., Port Hope, Ont.

Soldering Iron Heaters.
Consumers' Gas Co., Toronto.

Shingles, Galvanized Steel.
Galt Art Metal Co., Galt, Ont.

Shingles, Metal.
Metal Shingle & Siding Co., Preston, Ont.

Shooks.
Georgian Bay Shook Mills, Midland, Ont.

Skylights.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

Sidewalk Prisms.
Consolidated Plate Glass Co., Toronto.

Siding, Steel.
Galt Art Metal Co., Galt, Ont.

Sill and Cap Molds.
Ideal Concrete Machinery Co., London, Ont.

Sinks (Kitchen and Wash).
Standard Ideal Co., Port Hope, Ont.

Spanish Roofing Tile Machines.
Ideal Concrete Machinery Co., London, Ont.

Stairs, Iron.
George B. Meadows, Toronto

Stanchions.
Metal Shingle & Siding Co., Preston, Ont.

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Metal Shingle & Siding Co., Preston, Ont.

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Store Front Bars.
Consolidated Plate Glass Co., Toronto.

Terra Cotta.
Toronto Plate Glass Importing Co., Toronto.

Thimbles.
Metal Shingle & Siding Co., Preston, Ont.

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Standard Ideal Co., Port Hope, Ont.

Valley, Galvanized.
Metal Shingle & Siding Co., Preston, Ont.

"V" Crimp Roofing and Siding.
Metal Shingle & Siding Co., Preston, Ont.

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Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.

Wall Plugs.
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Metal Shingle & Siding Co., Preston, Ont.

Wire Work.
George B. Meadows, Toronto.

Woodworkers.
Elliot Woodworker Co., Toronto.

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Notice to Readers

Have you put up what you consider an attractive house recently?

You will have drawings or blue prints, bills of materials and specifications.

Why not send them to us for publication in The Canadian Builder. The advertising you would get as a result would make it well worth your while.

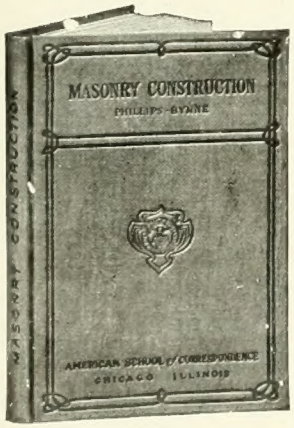
The Commercial Press, Limited
Toronto

Five Reasons for Subscribing to The Canadian Builder

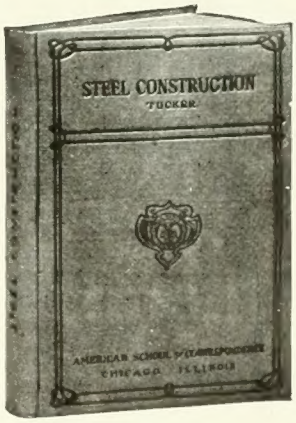
It publishes plans of actual buildings suitable for erection by the average builder. It aims at raising the standard of the trade in Canada. It contains items of practical value in every department of the trade. It furnishes special articles by leading experts every month. It gives news of Builders' Exchanges throughout the country.

Practical, Moderate-Priced HANDBOOKS

For the Contractor, Architect, Carpenter and Builder



MASONRY CONSTRUCTION. By **Alfred E. Phillips, C. E., Ph. D.,** Professor of Civil Engineering, Armour Institute of Technology, and **Austin T. Byrne,** Civil Engineer. 145 pp., 44 illus. Cloth binding. A handbook of practical information for Stonemasons, Stonecutters, Bricklayers, Cement and Concrete Workers, etc., embodying the latest and best American practice. It describes the various kinds of building stone; manufacture of brick, cement, and mortar; methods of test; foundation work, pile-driving; dam and wall construction; arch and bridge construction; reinforced concrete, etc. Price.....$1.00



STEEL CONSTRUCTION. By **E. A. Tucker, S. B.,** Architectural Engineer, American Society of Civil Engineers. 308 pp., 287 illus. Cloth binding. An up-to-date work containing a fund of invaluable practical information based on actual experience, special test, etc., for the use of Architects, Bridge Builders, Contractors, and Civil Engineers. This book will be found a most complete and serviceable guide covering every phase of the use of steel in structural work of all sorts, steel shapes, and fireproof construction; calculation of shapes; frame connections and details; foundations; high-building construction; mill building, etc. Price.....$1.50

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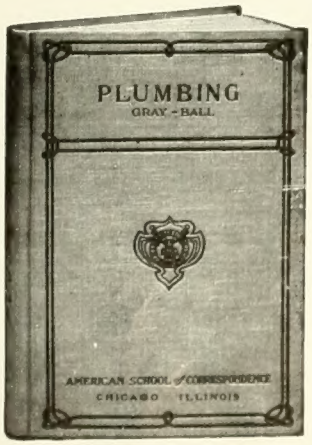
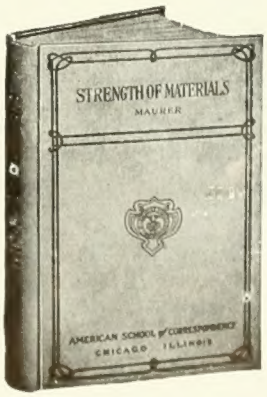


STRENGTH OF MATERIALS. By **Edward Rose Maurer, B. C. E.,** Professor of Mechanics, University of Wisconsin. 150 pp., 58 illus. Cloth binding. A work of great value to Architects, Builders, Designers, Steel and Concrete Workers. Strength of timber, wrought iron, steel, cast iron, brick, stone, etc., under all loads; strength of built-up sections; strength of beams, columns, shafts, riveted joints, etc. Price.....$1.00



PLUMBING. By **William Beall Gray,** Sanitary Engineer, and **Charles B. Ball,** Chief Sanitary Inspector, City of Chicago, American Society of Civil Engineers. 256 pp., 250 illus. Cloth binding. How to select the fixtures for jobs of any size; the installation and repair of hot and cold house-water supply, siphoning and antisiphoning traps; diagrams of pipe connections; septic tanks; drains; soil pipes; pipe fitting; wiping joints; gas fittings; plumbing regulations. Price.....$1.50

Send order to

The

Canadian Builder Book Department

408 McKinnon Building, Toronto

The Canadian Builder—

A Record of Note

Some Information of Interest

To those firms who are now advertising and also to such firms as are not now advertising, but who will be at some time.

¶ In the Spring of this year the total paid circulation of *The Canadian Builder* numbered less than 1,000.

The total paid circulation of this issue is close to 4,000.

This increase of 3,000 has been secured in little more than 4 months.

What Readers Think of the Paper

"'Tis almost superfluous to say that I am entirely pleased with The Canadian Builder, believing that it stands to comply admirably with the needs of those in any way connected with the building trade."

GILBERT A. CLOTHIER, Toronto

This is a sample of the unsolicited letters we are getting from our readers.

Results Advertisers are Getting

"We must confess that we are well pleased with the results so far obtained from our advertisement in The Canadian Builder. Kindly advise what will be the charge to continue full page instead of half page as arranged."

THE GEORGIAN BAY SHOOK MILLS, Limited
Midland, Ont.

"We might say for your information that we are receiving, both directly and indirectly very good results from the advertisement which we are carrying in your paper. In fact the writer has to admit that the results are surprising."

THE HURLEY MACHINE CO., Limited, Toronto

These two are samples of the unsolicited letters we have had from advertisers expressing their appreciation of the good results they have had from the paper. More than half the advertisers have signified their satisfaction with the results obtained from the paper.

Send for complete information and rates. Rates will be advanced as soon as circulation reaches 5,000.

The Commercial Press, Limited

Toronto, Canada